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Technical Note N-1217

AIRFIELD PAVEMENT CONDITION SURVEY,
USNLF MONTEREY, CALIFORNIA

By

H. Tomita and L. J. Woloszynski

January 1972

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NAVAL CIVIL ENGINEERING LABORATORY
Port Hueneme, California 93043

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ABSTRACT

The results of a condition survey of the airfield pavements at the USNLF Monterey, California are presented. The survey established statistically-based condition numbers (weighted defect densities) which were direct indicators of the condition of the individual asphaltic concrete and portland cement concrete pavement facilities. Additional evaluation efforts included photographic coverage of defect types, preparation of the construction history of the station, compilation of data on current aircraft traffic and aircraft types using the station, performance of runway skid resistance tests, and a study of the requirements for future pavement evaluation efforts.

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INTRODUCTION

In October, 1969, the Naval Facilities Engineering Command authorized a series of periodic pavement condition surveys to be conducted at Naval and Marine Corps air stations. The purpose of this condition survey task is to determine the suitability of the airfield pavement surfaces for aircraft operational requirements and to establish a uniform basis for maintenance and repair efforts. During the month of September, 1971, a pavement condition survey was conducted at the U. S. Naval Auxiliary Landing Field, Monterey, California. The survey consisted of a sophisticated, statistically-based procedure of pavement defect identification and defect measurement which permitted the establishment of condition numbers (weighted defect densities) which are direct indicators of the surface condition of the asphaltic concrete (AC) and/or portland cement concrete (PCC) airfield pavement facilities. Though different survey techniques were used for the two pavement types, the resulting defect densities often were similar numerically. However, this was coincidental. The defect densities for the two types of pavement are incompatible and must be considered separately. Additional survey efforts included photographic coverage of defect types, preparation of the construction history of the station, compilation of data on current aircraft traffic and aircraft types using the station, performance of runway skid resistance tests, and delineation of requirements for future pavement evaluation efforts at the station.

BACKGROUND

The U. S. Auxiliary Landing Field, Monterey, is located near the city of Monterey in Monterey County, California, at an elevation of 220 feet. An aerial photograph of the station is shown in Figure 1. The airfield has two runways. The main runway, Runway 10-28, is 6,600 feet long. The other runway, Runway 6-24, is 4,000 feet long. The airport is operated by the Monterey Peninsula Airport District, and the Naval facilities are all grouped in the northern portion of the airport on land leased to the Navy from the Airport District. Commercial and private facilities are grouped in the south portion of the airport. The mission of the Naval facilities is to provide aviation facilities for the Naval Postgraduate School at Monterey.

CONSTRUCTION HISTORY

Both runways and parallel taxiways were built in 1942. Runway 10-28 and a parallel taxiway (South Taxiway) were extended from 5,000 feet to 6,600 feet in 1967, and at the same time, the original 5,000 feet of Runway 10-28 was overlaid with asphaltic concrete. A complete history of construction and recorded maintenance is provided in Appendix A.

CURRENT AIRCRAFT TRAFFIC

A tabulation of the number of aircraft operations for a 12-month period is shown in Table 1. Table 2 lists the aircraft normally based at the station and transient aircraft observed using the station during the period of the condition survey.

CONDITION SURVEY PROCEDURES

The condition survey procedures used in this study are as follows:

Step 1. Preliminary Survey

In the preliminary survey the evaluators made a general and personal inspection of all airfield pavement areas, during which they noted the type and distribution of defects in each facility (runway, taxiway, etc.). In addition, a previously-prepared construction history was consulted and areas of different construction and different pavement type (AC or PCC) within a facility were noted. As a result of these efforts, each pavement facility was then divided into "discrete areas" of reasonably similar failure modes for performance of the subsequent sampling and tally or measurement of defects. Thus, if the type and/or number of defects found in one portion of a facility were distinctly different from those found in another portion of that facility, discrete areas were selected on this basis. If, however, the pavement facility contained few defects or if the defects found were similar in type and distribution throughout the facility, each facility was individually divided for survey according to the construction history. Under either criterion, a discrete area may vary, for example, from a 500 foot length of runway or taxiway to the entire length of the facility. Discrete areas selected at NALF Monterey are shown in Figure 2. Note that all discrete areas are numbered with a system that relates the discrete area to the runway, taxiway, etc., of which it is a part. For example, discrete areas comprising Runway 10-28 are designated R10-1 and R10-2, respectively; discrete areas for South Taxiway are ST-1 through ST-6, respectively, and so on.

A special survey of singular occurrences of serious defects was made during the preliminary survey. This is necessary because the statistical sampling techniques utilized in the subsequent survey are effective in spotting defects only when such defects are numerous and/or relatively well distributed. This abbreviated special survey provided information on those infrequent defects, if any, which may present a problem to safe aircraft operation.

Step 2. Statistical Sampling and Defect Survey

After selection of discrete areas, a number of small "sample areas" were chosen within each discrete area. The total number of sample areas was determined by statistical theory, as a function of the relative size of the discrete area. Actual locations of the sample areas were selected at random from the discrete area.

Sample areas in PCC pavements basically consisted of individual slabs, usually 12-1/2 x 15 feet in size. For the convenience of the evaluators, either a single slab or a number of adjacent slabs can be considered as a sample area. Both types of sampling area are shown in schematic in Figure 3. Note from Figure 3 that individual sample slabs and/or sample strips were selected within the center 100 feet (laterally) of runways and within the center 50 feet (laterally) of taxiways by a random selection process. For parking aprons, mats, etc., similar sample areas were selected at random over the entire pavement area.

For AC pavements, sample areas were 50-foot square areas, located as shown in Figure 4. For parking aprons, mats, etc. (not shown in Figure 4) sample areas were 50 feet square, as for other traffic areas, and randomly located over the entire pavement area.

All defects or defected slabs in each of the selected sample areas were noted on appropriate data sheets. For PCC pavement slabs or sample strips either single or multiple occurrences of a given defect type within the slab qualified the slab as a defected slab. For example, one or more spalls qualified a slab as a spalled slab. A crack in the same slab required that it be counted again, this time as a cracked slab. No measurement of length, area, etc., was recorded for PCC pavement defects. When a sample slab strip was chosen for test, the above mentioned tally method (slab by slab) was still utilized.

The defects found in AC sample areas were measured and tallied, rather than merely tallied as were those for PCC pavements. Depending on the type of defect, the total length in feet (for cracks, etc.) or total area in square feet (for pattern cracking, raveling, etc.) was recorded.

The above survey of defects found in sample areas (in each discrete area) are shown in column (c) of the Discrete Area Defect Summary sheets, pages 33 through 70 of this report. Separate summary sheets are provided for portland cement concrete (PCC) and asphaltic

concrete (AC) pavements. Total defect counts for the entire discrete area were calculated by a linear extrapolation of the defect data in column (c), and are shown in column (d) of the Discrete Area Defect Summary sheets. To remove the influence of the size of the discrete area on the total defect count (i.e., the bigger the area, the larger the defect count), the total defect count was divided by either the number of slabs in the discrete area (for PCC pavements) or by the area (in 10 square-foot increments) of the discrete area (for AC pavements). This gives a defect density (per slab or per 10 square feet) which is listed in column (e).

Step 3. Defect Severity Weighting System

A weighting system, providing a numerical weight for each type defect in proportion to the relative severity of that defect, was applied in the following manner to each of the defect counts in the discrete area:

$$\text{given defect density} \times \frac{\text{weight for that type defect}}{\text{density}} = \text{weighted defect density}$$

This is accomplished in columns (f) and (g) of the Discrete Area Defect Summary sheets. Next, a total weighted defect density is obtained for each discrete area by summing column (g) of these sheets. Note that a letter suffix is added to each total weighted defect density for the purpose of further distinguishing between asphaltic concrete defect densities (suffix "A") and portland cement concrete defect densities (suffix "C").

The defect weighting guide developed by NCEL assigns greater weights to defects that (1) presently affect the safe operation of aircraft or the cost of aircraft operation; (2) will lead to increased airfield pavement maintenance costs; or (3) will result in significant deterioration of load-carrying capacity of the pavements. The resultant numerical weights were further modified to reflect variations in pavement environment from station to station. For example, higher (more severe) weights were assigned to defects which are affected by factors such as freezing weather, heavy rainfall, or blow sand for surveys of airfields located in areas where these undesirable environmental effects occur. Thus, it can be seen that the higher the numerical weighted defect density, the poorer the condition of the surveyed pavement. Defect severity weights used in calculating weighted defect densities at NALF Monterey are given in Table 3.

Remarks concerning the general pavement condition and the defects identified are given in narrative form on each Discrete Area Summary sheet. In addition, photographs of typical pavement conditions noted during the survey can be seen in Figures 5 through 21.

Step 4. Facility Summary--Weighted Defect Densities

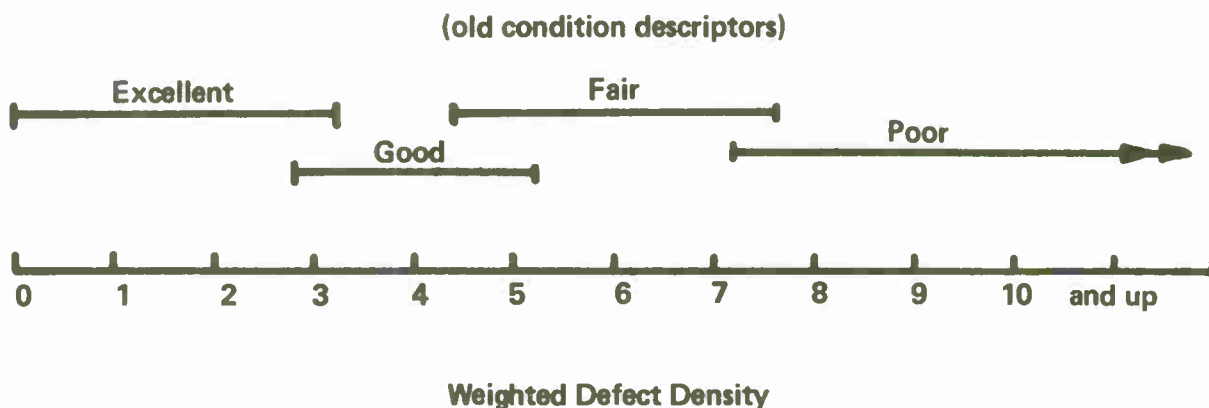
A final step in providing a numerical condition rating for each facility (runway, taxiway, etc.) is accomplished in the Facility Defect Summary sheets, pages 71 through 76 of this report. Again note that separate sheets have been provided for AC and PCC pavements. In these sheets the individual weighted defect densities for all discrete areas comprising the entire AC or PCC portion of a facility (runway, taxiway, etc.) are summarized in column (a). When an AC or PCC facility (or portion) has been divided into more than one discrete area for the condition survey, the proportional contribution of each discrete area to the entire AC or PCC facility area is determined in column (b). In column (c) these proportions are applied to the individual discrete area weighted defect densities listed in column (a) and added to obtain an overall average weighted defect density for the entire AC or PCC portion of the facility (marked "Total" in column (c)). When an entire AC or PCC facility (or portion) has been designated as a single discrete area (as often occurs), the proportionality factor in column (b) is obviously 1.00 and the discrete area weighted defect density from column (a) becomes the average weighted defect density for the entire facility (or portion) in column (c).

GENERAL COMMENTS ON CONDITION SURVEY PROGRAM

The weighted defect densities, listed in column (a) of the Facility Defect Summary for individual discrete pavement areas and in column (c) as averaged weighted defect densities for entire AC or PCC runways, taxiways, etc. (or portions thereof) represent, numerically, the surface condition of the airfield pavements at the station. As previously stated, the larger defect density numbers indicate basically a greater number and/or severity of defects per unit area of pavement, i.e., a poorer pavement. Thus, they represent the final product of the pavement condition survey. It should be noted specifically, however, that AC and PCC pavement defect densities, although often numerically similar, are obtained by two different condition survey techniques and, as such, are not numerically compatible and must not be combined. (It is largely because of this fact that the letter suffixes "A" and "C" have been affixed to defect densities for AC and PCC pavements respectively.) As an example consider the common case of an AC runway with PCC ends. The condition survey system presented herein provides individual discrete area weighted defect densities for discrete areas selected on both AC and PCC pavements, but provides a separate average weighted defect density for the combined PCC end pavement. It is not possible to combine these defect densities to obtain an averaged AC/PCC defect density for the entire runway. Thus the defect densities for AC and PCC are reported separately, given different letter suffixes, and should include the letter suffix when reference is made to them.

Individual numerical defect densities, however accurately they indicate pavement condition, may mean little to the reader of an individual airfield condition survey report, for he has no basis upon which to judge the relative severity of pavement condition associated with the numbers obtained for his pavements. The primary value of a numerical condition survey program will be the accumulation of uniformly-obtained, comparative condition data for many airfields which can best be correlated, studied, and used in the decision-making processes at headquarters levels.

For the benefit of the individual reader, however, an effort was made during the first year of pavement condition surveys (FY-70) to relate the numerical condition (defect densities) to the basic subjective condition descriptors (excellent, good, fair, poor, etc.) used in all previous Navy pavement evaluation procedures. Although the subjective, condition-descriptor approach is poorly regarded as a means of comparing pavement condition from one airfield to another, the following diagram may serve temporarily as a rudimentary bridge between the old subjective system and the new (numerical) condition approach:



The numerical defect densities presented in this report were developed to aid in determining the suitability of the airfield pavement surfaces for aircraft operational requirements and to establish an unbiased, uniform basis for initiating maintenance and repair efforts. As such, defect densities are simply visually-determined indicators of the condition of the pavement and do not represent true "condition ratings" in that they do not include factors relating to pavement strengths, traffic usage, etc. It is possible that additional measurements or modifications may be considered necessary or desirable in future condition survey programs.

RESULTS OF CONDITION SURVEY

Weighted defect densities for discrete areas selected on AC pavements at NALF Monterey ranged from 0.00A (no defects visible) for the best AC discrete area to a worst defect density of 22.76A for a portion of the South Taxiway. Average weighted defect densities for entire AC portions of runways at NALF Monterey ranged from 1.69A for Runway 10-28 to 2.10A for Runway 6-24.

Weighted defect densities for discrete areas selected on PCC pavements ranged from 0.79C for the best PCC discrete area (Parking Apron 2) to a worst defect density of 11.37C (for a portion of Parking Apron 3).

RESULTS OF ASSOCIATED FIELD TESTS

In order to determine the skid resistance characteristics of the runway pavements at NALF Monterey, vehicle braking tests were performed using a calibrated decelerometer. Tests were conducted at selected locations on the asphaltic concrete portions of Runway 10-28 and Runway 6-24 with the surfaces wet. A vehicle speed of 30 miles per hour was used in all tests. The average decelerometer readings and the resultant friction coefficients are shown below:

Runway	Station	Decelerometer Reading (feet per second per second)	Friction Coefficient
10-28	5+00 (10 end)	19	0.59
10-28	57+00 (28 end)	13	0.40
6-24	7+00 (6 end)	19	0.59
6-24	36+00 (24 end)	19	0.59

Although the Navy, at present, has no official standard or specification for pavement skid resistance, a study of the literature, coupled with the results of limited skid resistance testing performed by NCEL in recent years, indicates that friction coefficients of 0.5 and higher may be considered generally acceptable for airfield pavements. Thus, the pavements at NALF Monterey exhibited a degree of skid resistance in the acceptable range with the exception of the 28 end of Runway 10-28 which had a friction coefficient slightly below 0.5.

RECOMMENDATIONS FOR FURTHER EVALUATION EFFORTS

A pavement evaluation was performed at NALF Monterey in 1967 (see reference 1). Since then, however, Runway 10-28 and the South Taxiway have been overlaid and extended. A new series of surface plate bearing tests is recommended to provide up-to-date load ratings for these pavements.

Table 1. Aircraft Operations Data for
USNALF Monterey, California

Month	Number of Operations
July 1970	5,236
August	4,954
September	5,939
October	5,339
November	4,930
December	4,550
January 1971	5,706
February	5,607
March	5,764
April	6,400
May	5,880
June	5,041
Average monthly operations	5,447

Note: Estimated percent of operations by aircraft with
over 20,000-pounds single-gear load: 10%

Table 2. Aircraft Using USNALF Monterey,
California

Aircraft based at station:	S2, T1, T28, H34
Transient aircraft using station:	727, 737, DC-9, Convair 990

Table 3. Defect Severity Weights

Airfield: USNLF Monterey, California

Asphaltic Concrete		Portland Cement Concrete	
<u>Defect</u>	<u>Weight</u>	<u>Defect</u>	<u>Weight</u>
Depression	9.0	Depression	9.0
Rutting	9.0	Shattered Slab	9.0
Broken-up Area	9.0	Faulting	8.5
Faulting	8.5	Spalling	7.5
Raveling	7.0	Scaling	7.0
Erosion-Jet Blast	7.5	"D-Line" Cracking	6.5
Longitudinal, Transverse, or Longitudinal Construction Joint Crack	3.0	Pumping	4.0
Pattern Cracking	3.0	Poor Joint Seal	3.0
Patching	3.0	Corner Break	3.0
Reflection Crack	1.5	Intersecting Crack	3.0
Oil Spillage	1.5	Longitudinal or Transverse Crack	1.5

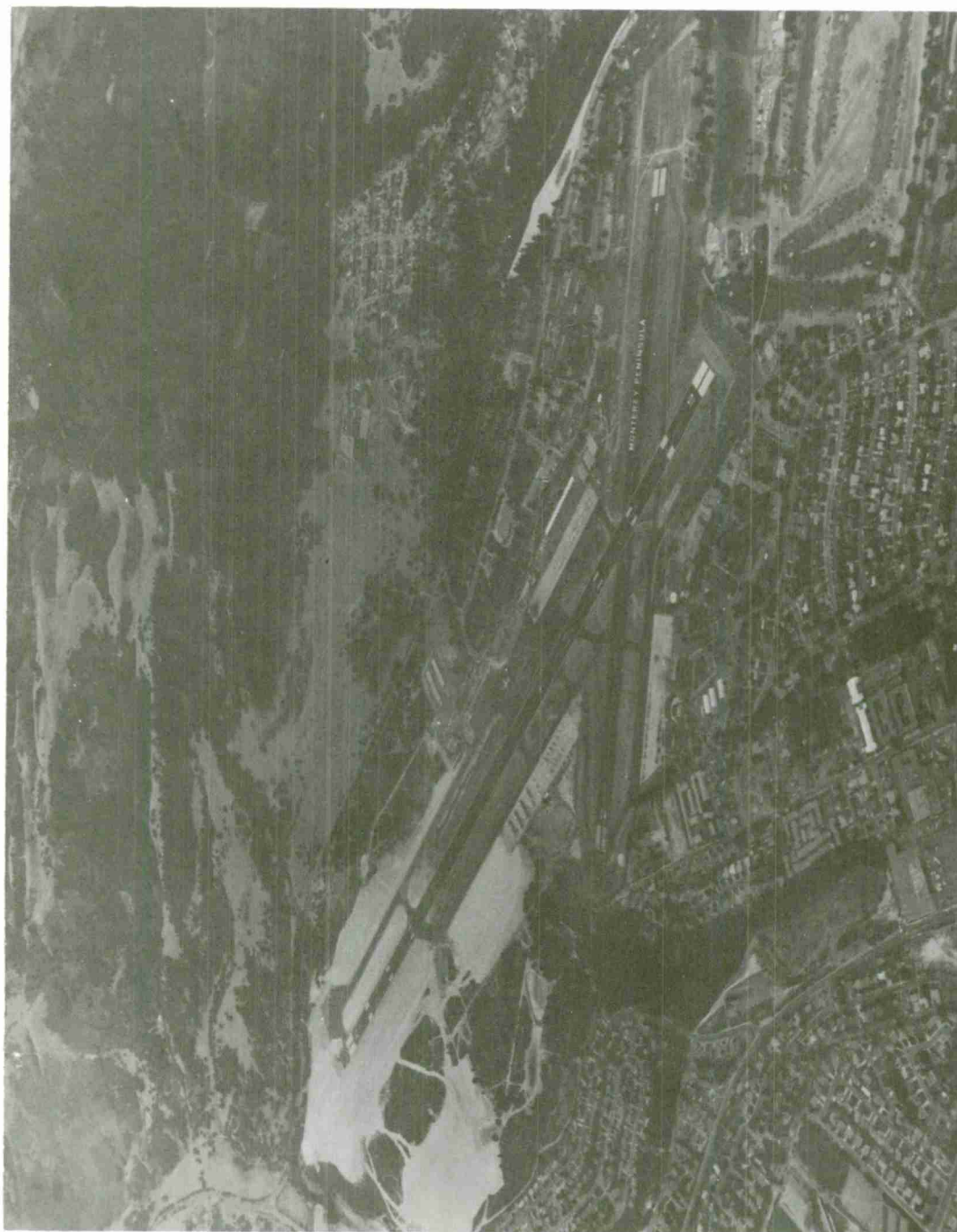
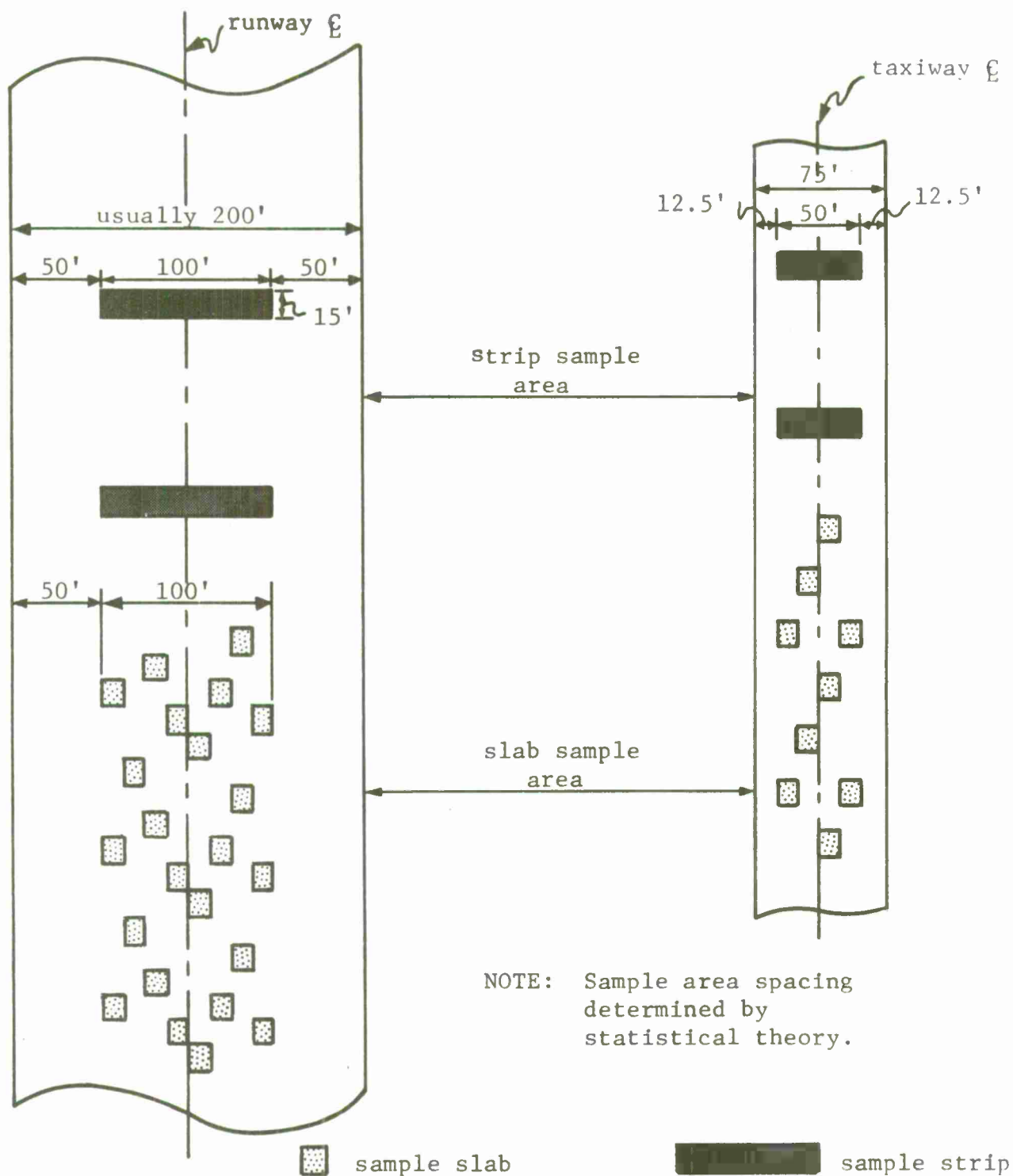


Figure 1. Aerial view of USNLF Monterey, California.



Typical Runway

Typical Taxiway

Figure 3. Portland cement concrete sample areas.

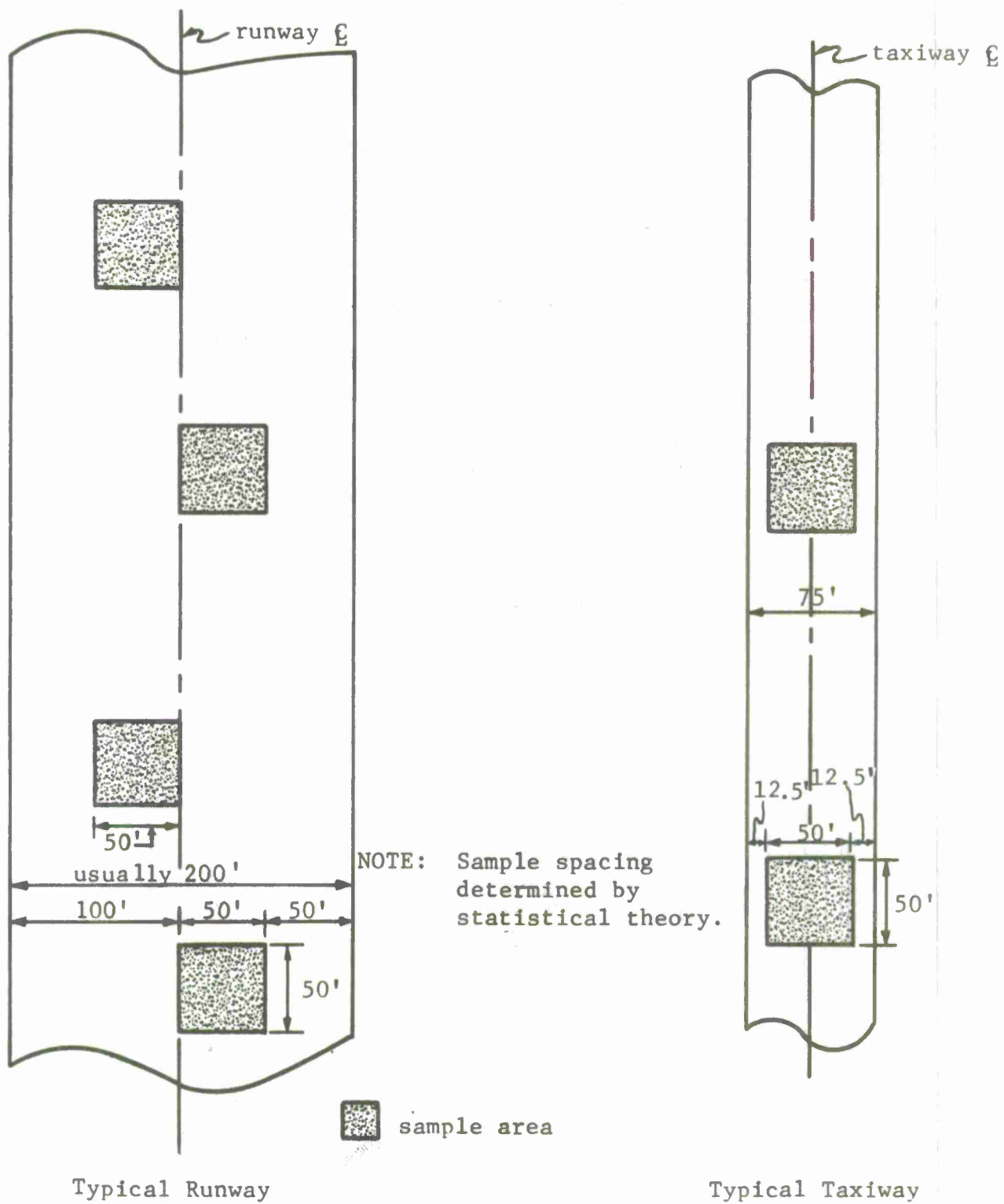


Figure 4. Asphaltic concrete sample areas.



Figure 5. Longitudinal construction joint crack, Discrete Area R6-1.

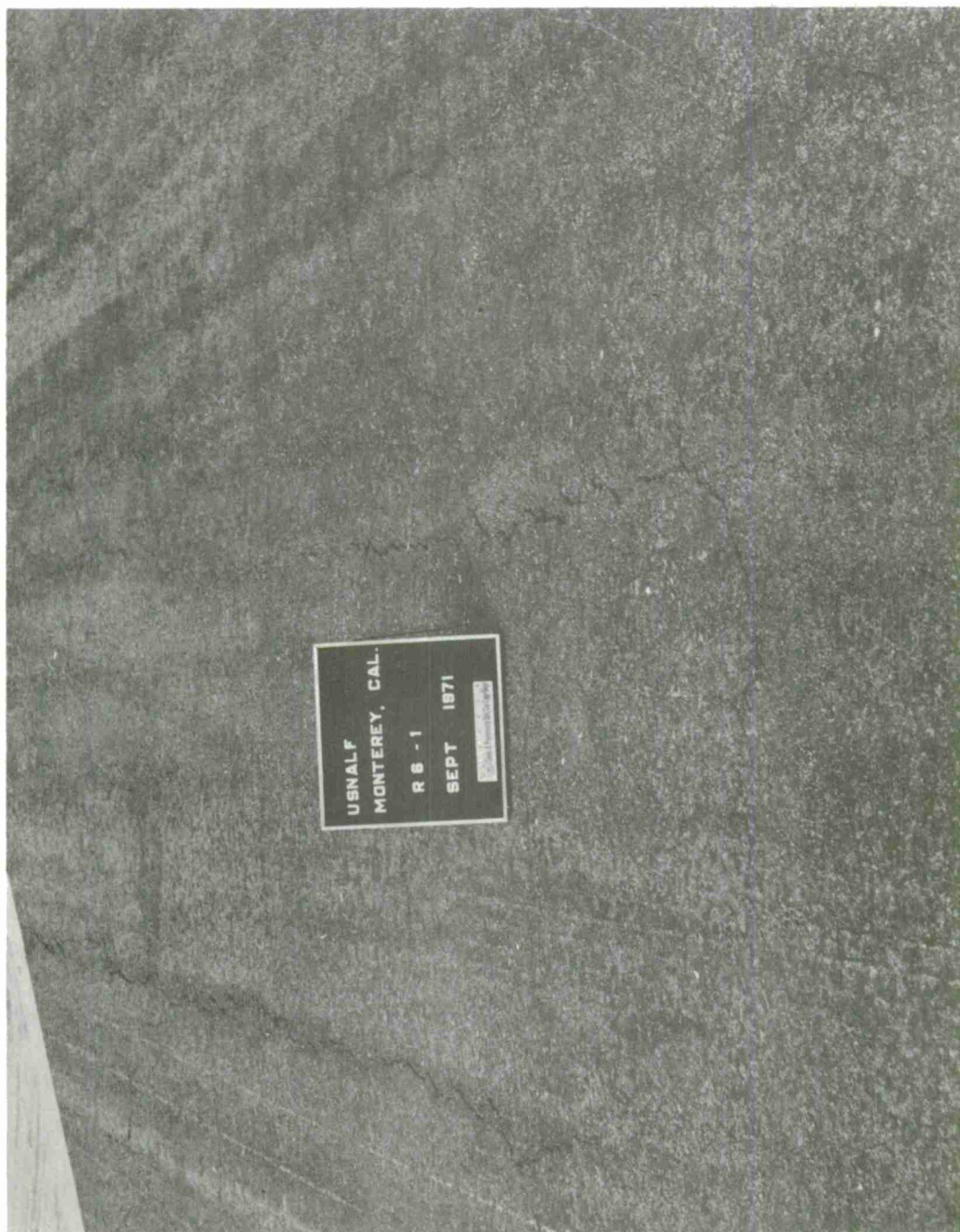


Figure 6. Pattern cracking, Discrete Area R6-1.



Figure 7. Longitudinal construction joint crack, Discrete Area R10-1.

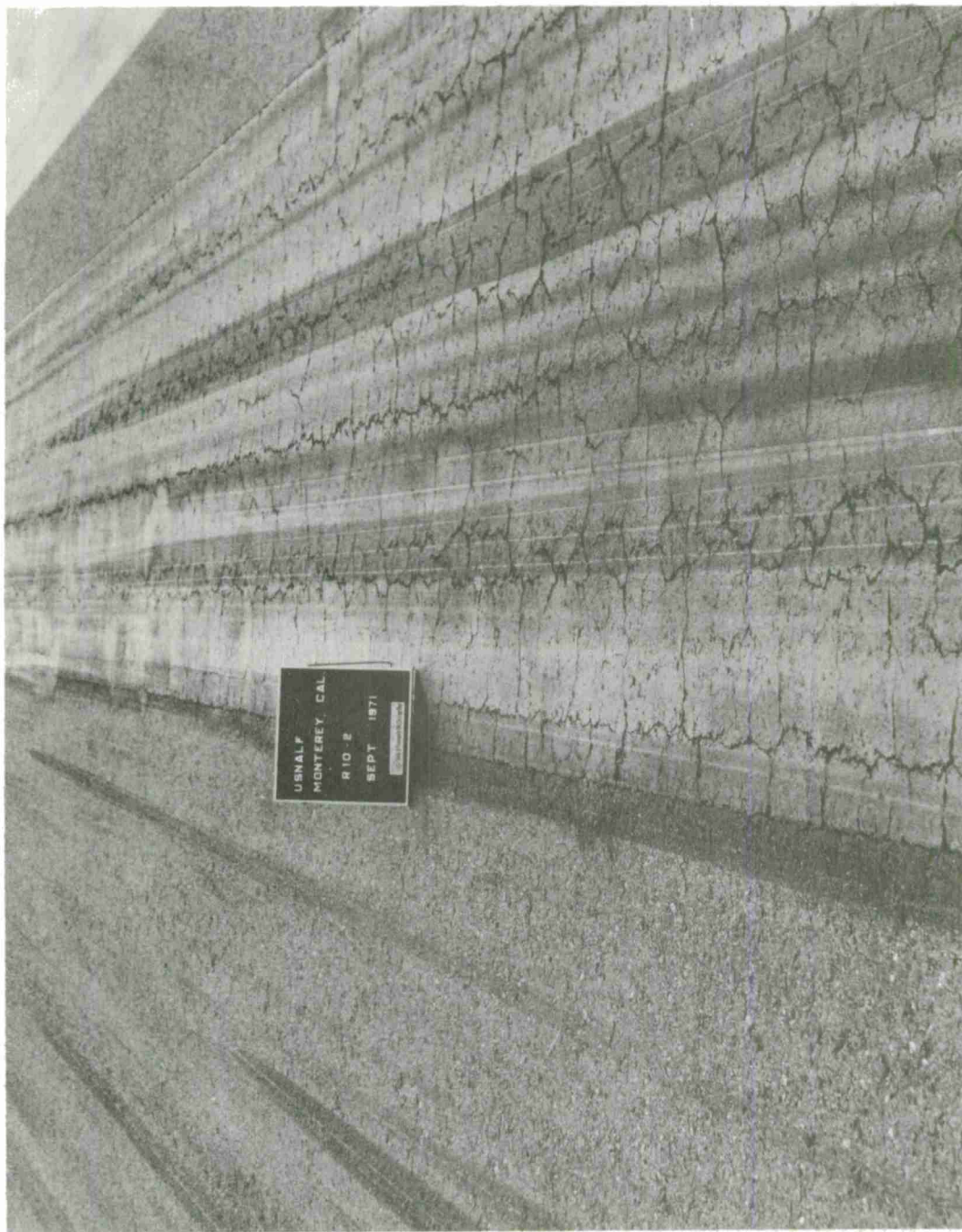


Figure 8. Pattern cracking under paint stripe, Discrete Area R10-2.



Figure 9. Surface condition showing exposed aggregate, Discrete Area T6-1.

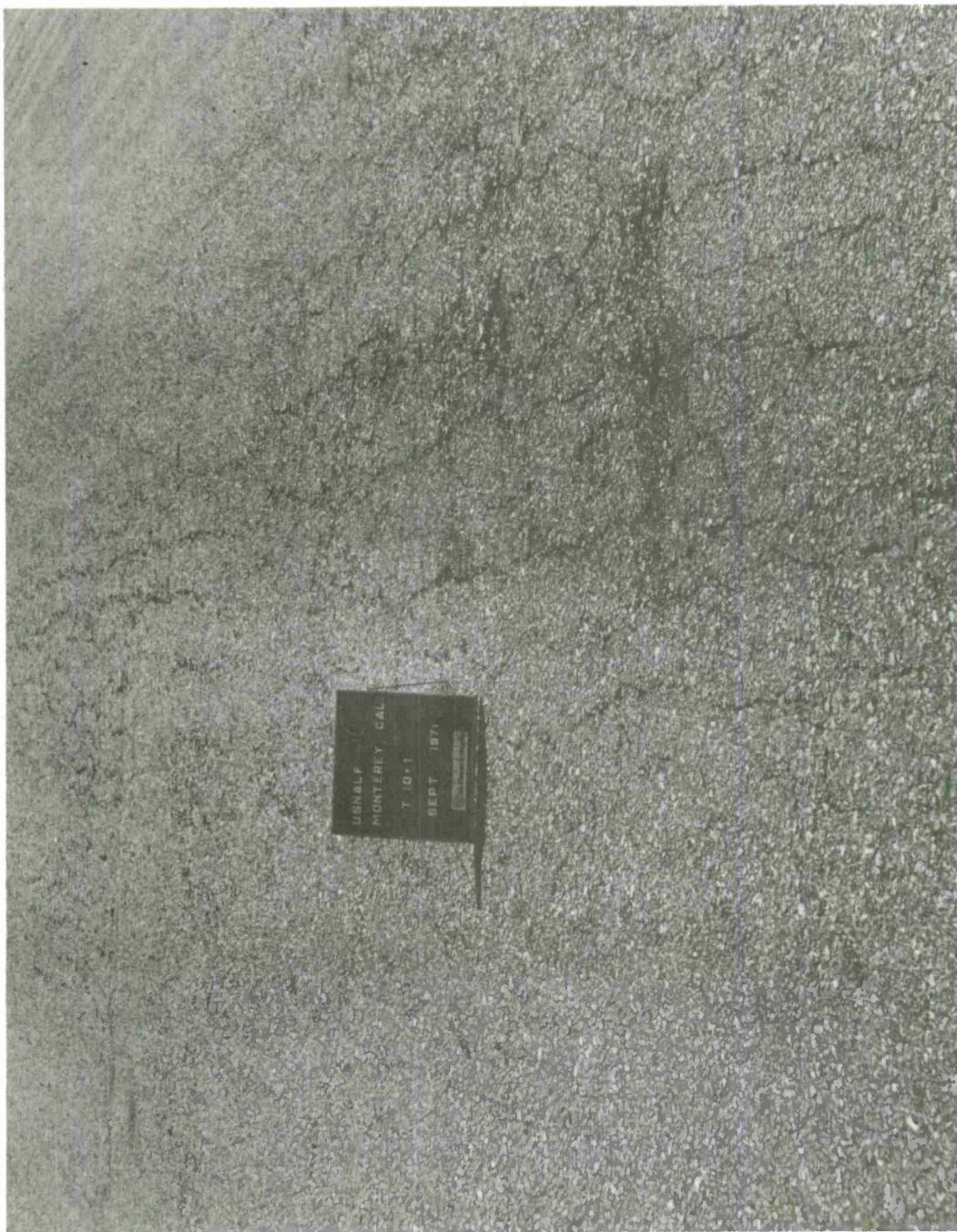


Figure 10. Pattern cracking, Discrete Area T10-1.



Figure 11. Pattern cracking, Discrete Area ST-4.



Figure 12. Broken up area, Discreet Area ST-5.



Figure 13. Pattern cracking, Discrete Area CT7-1.

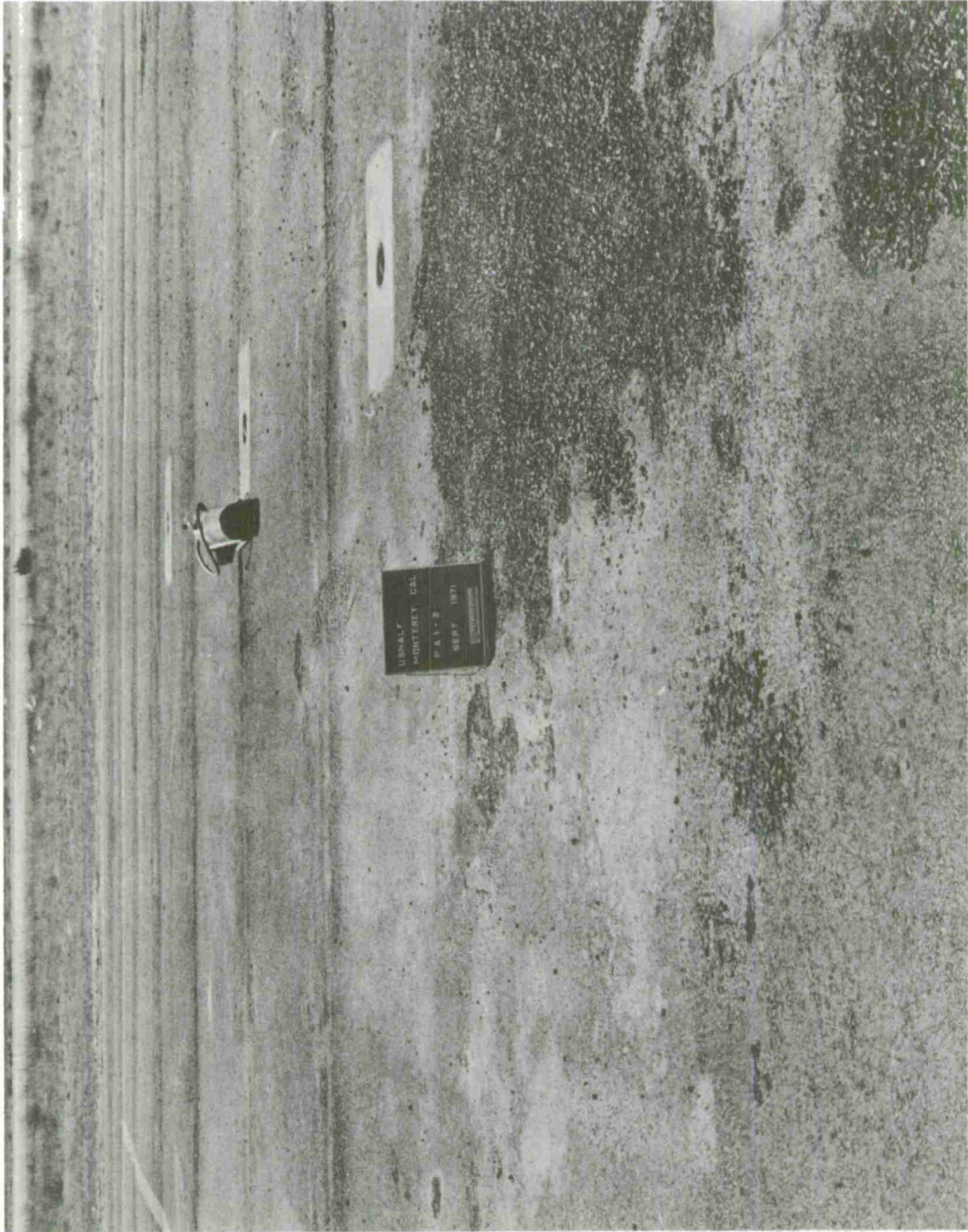


Figure 14. Erosion caused by fuel spillage, Discrete Area PA1-2.

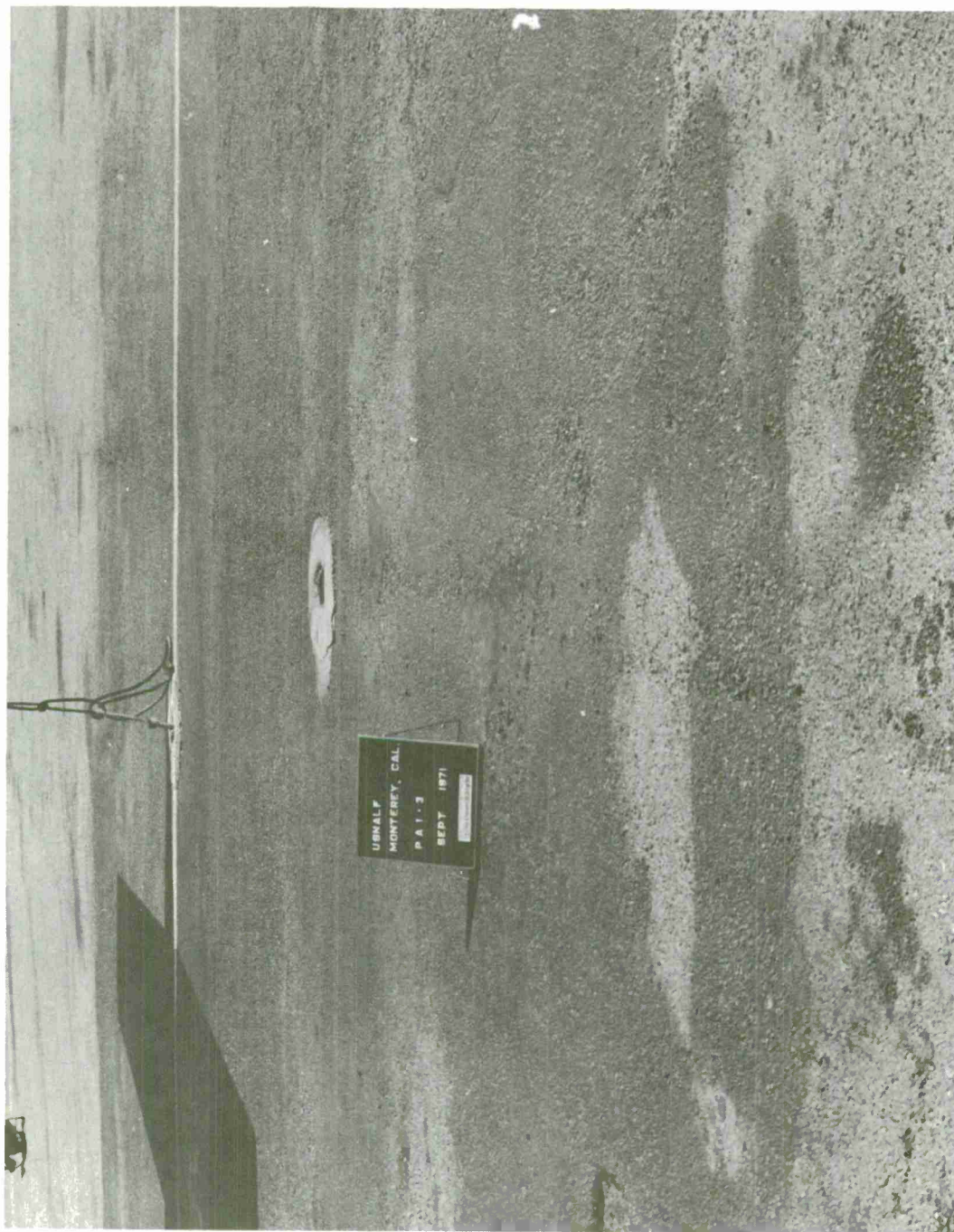


Figure 15. Fuel spillage and raveling, Discrete Area PA1-3.

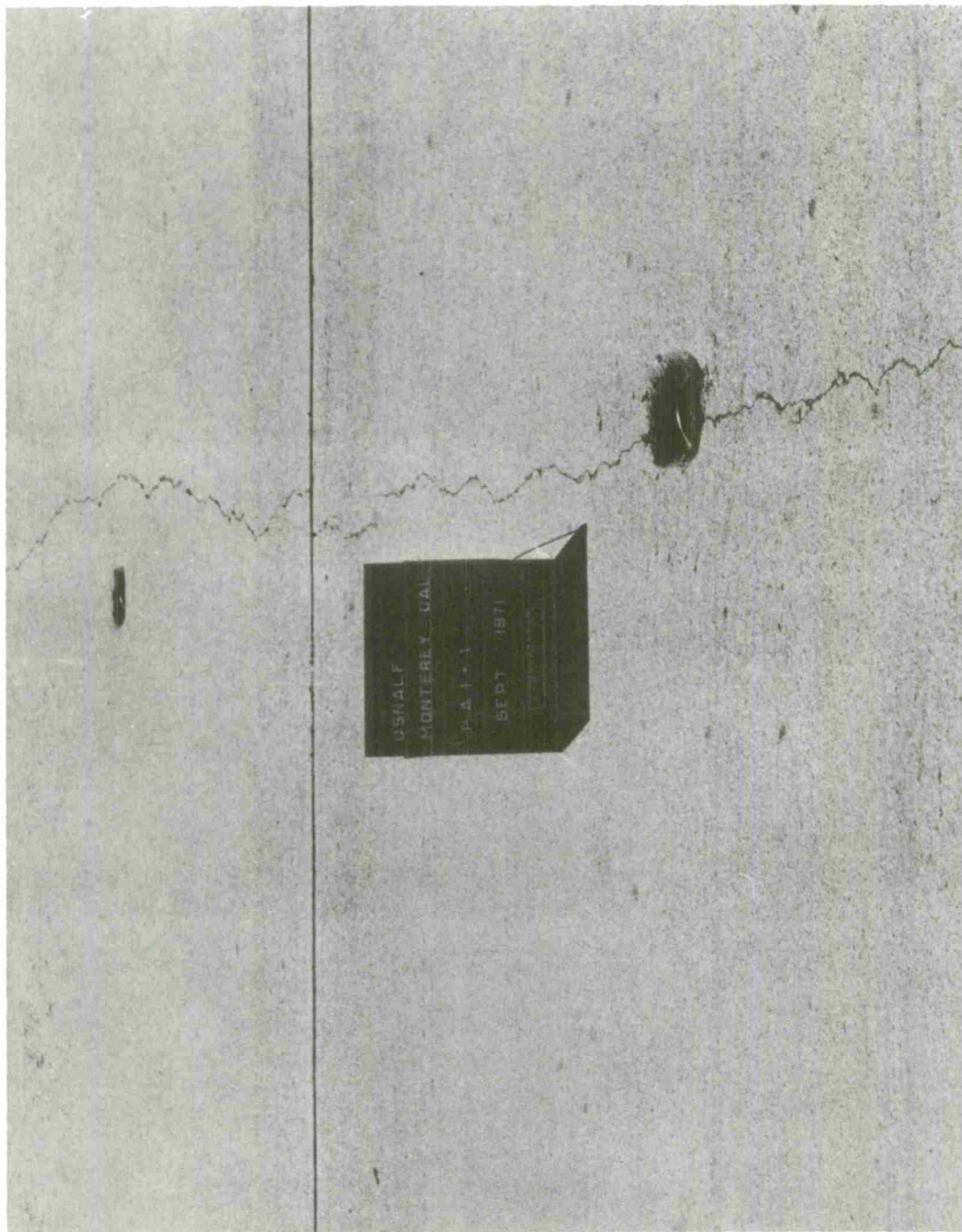


Figure 16. Transverse crack, Discrete Area PA1-1.

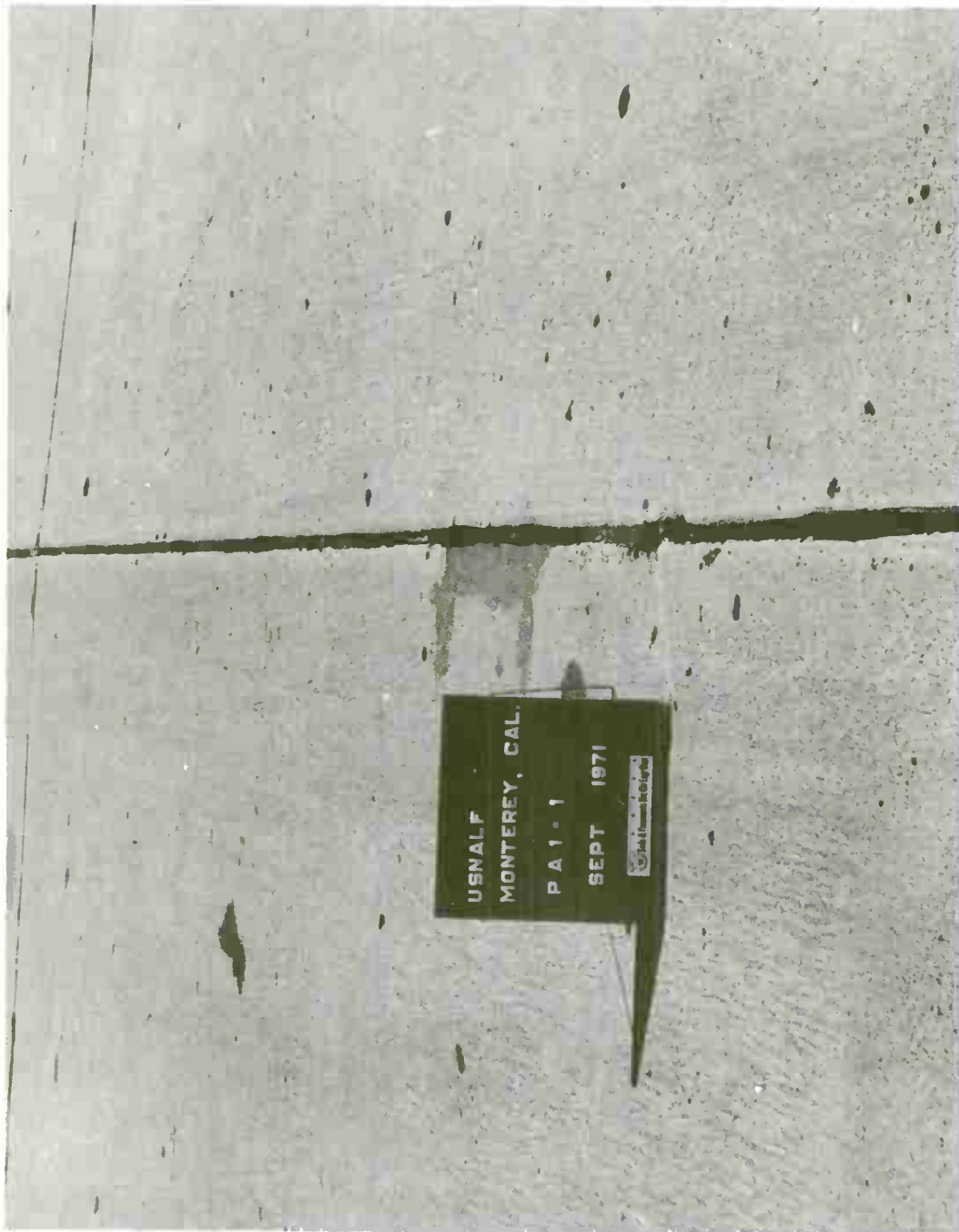


Figure 17. Vegetation growing in joint, Discrete Area PA1-1.



Figure 18. Spall on slab corner, Discrete Area PA3-1.

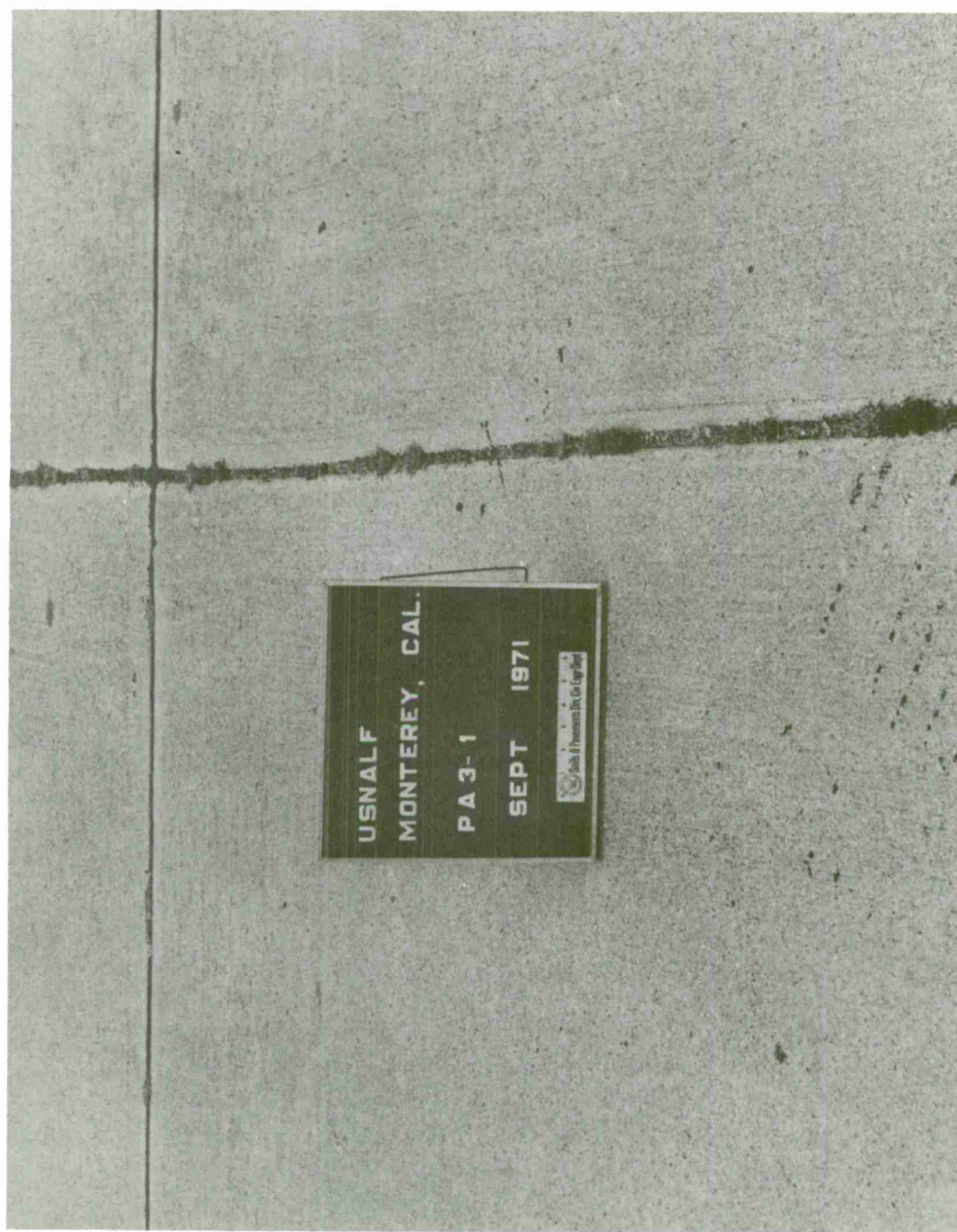


Figure 19. Vegetation growing through joint, Discrete Area PA3-1.



Figure 20. Spalling along transverse crack, Discrete Area PA3-2.

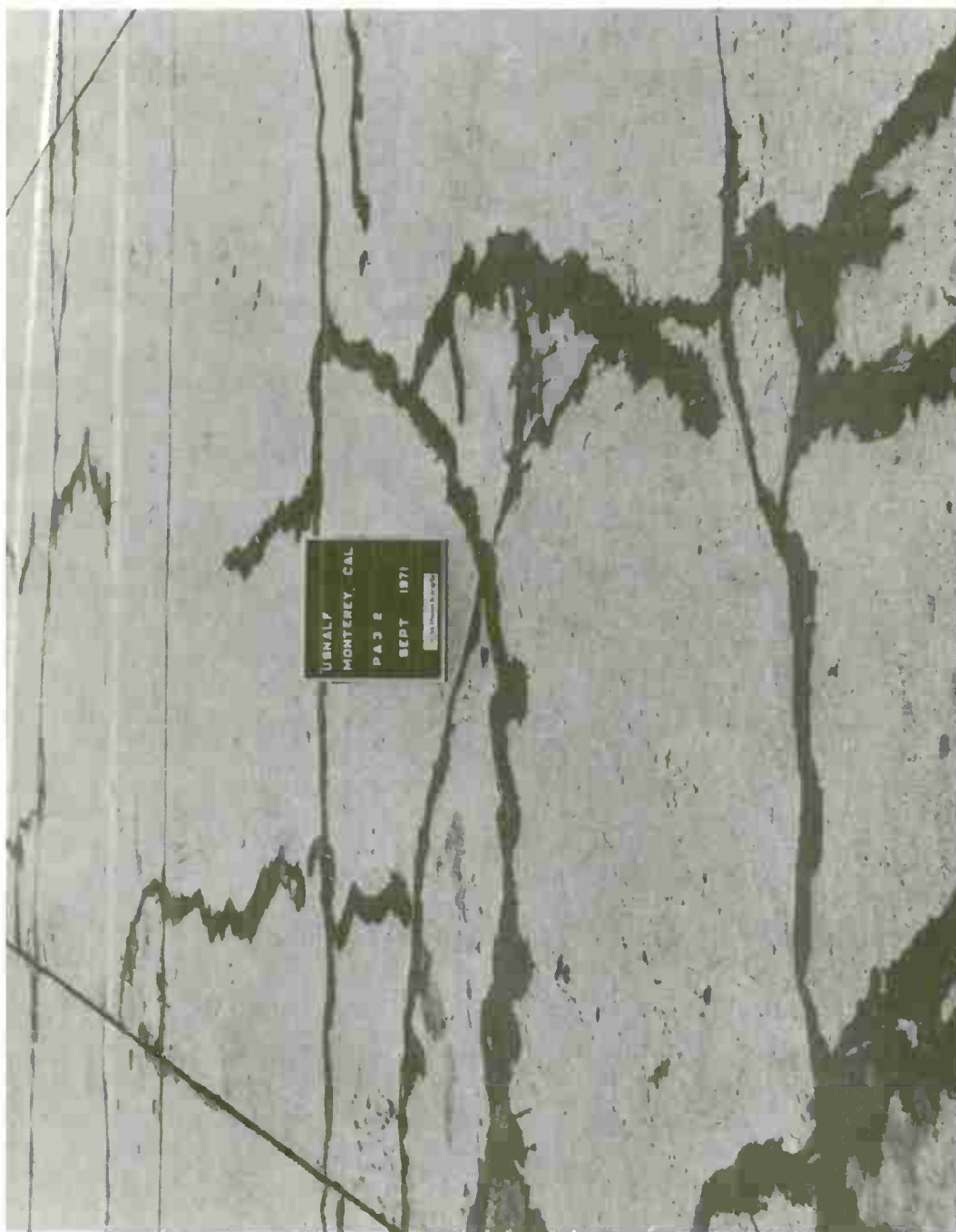


Figure 21. Shattered slab, Discrete Area PA3-2.

ASPHALTIC AND PORTLAND CEMENT CONCRETE
DISCRETE AREA DEFECT SUMMARY SHEETS

ASPHALTIC CONCRETE DISCRETE AREA DEFECT SUMMARY

Airfield USNALT Monterey Facility Runway 6-24

Discrete Area R6-1 Area of Discrete Area (a) 375,800 ft²

No. of Sample Areas (b) 16 Ratio: (a/2500b) 9.4

Defect Type	Length or Area of Sampled Defects	Total Length or Area of All Defects: (c) x Ratio	Defect Density (per 10 sq. ft.) 10 d/a	Defect Severity Weight	Weighted Defect Density: (e) x (f)
	(c)	(d)	(e)	(f)	(g)
T.C., L.C. or LCJ*	1,717 ft	16,140 ft	0.429	3.0	1.287
Reflection Crack					
Faulting					
Patching					
Settlement or Depression					
Pattern Cracking					
Rutting	1,080 ft ²	10,153 ft ²	0.270	3.0	0.810
Ravelling					
Erosion-Jet Blast					
Oil Spillage					
Broken-up Area					
Total					2.10A
Remarks on Pavement Condition					
Cracks, primarily on construction joints, were 1/8" wide, unsealed and had vegetation growing through them. Pattern cracking was of dendritic type with 2' to 4' branches and unsealed. The surface was rough with evidence of loss of fines, and approximately 25 percent of the aggregate on the surface was stripped of bitumen (see Figures 5 and 6).					

* Transverse crack, longitudinal crack or longitudinal construction joint crack.

** Letter suffix "A" indicates asphaltic pavement.

ASPHALTIC CONCRETE DISCRETE AREA DEFECT SUMMARY

Airfield USNALF Monterey Facility Runway 10-28

Discrete Area R10-1 Area of Discrete Area (a) 500,000 ft²

No. of Sample Areas (b) 15 Ratio: (a/2500b) 13.3

Defect Type	Length or Area of Sampled Defects	Total Length or Area of All Defects: (c) x Ratio	Defect Density (per 10 sq. ft.) 10 d/a	Defect Severity Weight	Weighted Defect Density: (e) x (f)
	(c)	(d)	(e)	(f)	(g)
T.C., L.C. or LCJ*	590 ft	7,847 ft	0.157	3.0	0.471
Reflection Crack					
Faulting					
Patching					
Settlement or Depression					
Pattern Cracking	2,000 ft	26,600 ft ²	0.532	3.0	1.596
Rutting					
Raveling	6 ft	80 ft ²	0.002	7.0	0.014
Erosion—Jet Blast					
Oil Spillage					
Broken-up Area					
Total					2.08A
<p>Remarks on Pavement Condition</p> <p>Raveling occurred along longitudinal construction joints, and some loose material was observed. Most cracks were along longitudinal construction joints. Surface condition was smooth, and very little stripping was evident (see Figure 7).</p>					

* Transverse crack, longitudinal crack or longitudinal construction joint crack.

** Letter suffix "A" indicates asphaltic pavement.

ASPHALTIC CONCRETE DISCRETE AREA DEFECT SUMMARY

Airfield USNLF Monterey Facility Runway 10-28

Discrete Area R10-2 Area of Discrete Area (a) 160,000 ft²

No. of Sample Areas (b) 16 Ratio: (a/2500b) 4.0

Defect Type	Length or Area of Sampled Defects	Total Length or Area of All Defects: (c) x Ratio	Defect Density (per 10 sq. ft.) 10 d/a	Defect Severity Weight	Weighted Defect Density: (e) x (f)
	(c)	(d)	(e)	(f)	(g)
T.C., L.C. or LCJ*					
Reflection Crack					
Faulting					
Patching					
Settlement or Depression					
Pattern Cracking	600 ft ²	2,400 ft ²	0.150	3.0	0.450
Rutting					
Ravelling					
Erosion-Jet Blast					
Oil Spillage					
Broken-up Area					
Total					0.45A

Remarks on Pavement Condition

Pattern cracking occurred under a painted stripe which had been covered with asphalt seal. Otherwise surface appearance was good with very little stripping (see Figure 8).

- * Transverse crack, longitudinal crack or longitudinal construction joint crack.
- ** Letter suffix "A" indicates asphaltic pavement.

ASPHALTIC CONCRETE DISCRETE AREA DEFECT SUMMARY

Airfield USNAF Monterey Facility Taxiway 6-24

Discrete Area T6-1 Area of Discrete Area (a) 183,250 ft²

No. of Sample Areas (b) 16 Ratio: (a/2500b) 4.6

Defect Type	Length or Area of Sampled Defects	Total Length or Area of All Defects: (c) x Ratio	Defect Density (per 10 sq. ft.) 10 d/a	Defect Severity Weight	Weighted Defect Density: (e) x (f)
	(c)	(d)	(e)	(f)	(g)
T.C., L.C. or LCJ*	1,653 ft	7,604 ft	0.415	3.0	1.245
Reflection Crack					
Faulting					
Patching					
Settlement or Depression					
Pattern Cracking	2,110 ft ²	9,706 ft ²	0.530	3.0	1.590
Rutting					
Raveling					
Erosion—Jet Blast					
Oil Spillage	170 ft ²	782 ft ²	0.043	1.5	0.065
Broken-up Area					
Total					2.90A
<p>Remarks on Pavement Condition</p> <p>Pattern cracking was of the dendritic type with 4" to 12" sides. Transverse and longitudinal cracks between 1/8" to 1/4" wide were unsealed, and some cracks had vegetation growing through them. Approximately 70 percent of the surface aggregate was stripped of bitumen (see Figure 9).</p>					

* Transverse crack, longitudinal crack or longitudinal construction joint crack.

** Letter suffix "A" indicates asphaltic pavement.

ASPHALTIC CONCRETE DISCRETE AREA DEFECT SUMMARY

Airfield USNALF Monterey Facility Taxiway 10-28
 Discrete Area T10-1 Area of Discrete Area (a) 240,700 ft²
 No. of Sample Areas (b) 16 Ratio: (a/2500b) 6.0

Defect Type	Length or Area of Sampled Defects	Total Length or Area of All Defects: (c) x Ratio	Defect Density (per 10 sq. ft.) 10 d/a	Defect Severity Weight	Weighted Defect Density: (e) x (f)
	(c)	(d)	(e)	(f)	(g)
T.C., L.C. or LCJ*	765 ft	4,590 ft	0.191	3.0	0.573
Reflection Crack					
Faulting					
Patching	100 ft ²	600 ft ²	0.025	3.0	0.075
Settlement or Depression					
Pattern Cracking	11,690 ft ²	70,140 ft ²	2.914	3.0	8.742
Rutting					
Reveling	12 ft ²	72 ft ²	0.003	7.0	0.021
Erosion-Jet Blast					
Oil Spillage					
Broken-up Area	350 ft ²	2,100 ft ²	0.087	9.0	0.783
Total					10.19A
Remarks on Pavement Condition					
Pattern cracking was a combination of shrinkage and dendritic types forming polygons with 6" to 2' sides. Approximately 3/4 of the surface aggregate was stripped of bitumen (see Figure 10).					

* Transverse crack, longitudinal crack or longitudinal construction joint crack.

** Letter suffix "A" indicates asphaltic pavement.

ASPHALTIC CONCRETE DISCRETE AREA DEFECT SUMMARY

Airfield USNALF Monterey Facility South Taxiway

Discrete Area ST-1 Area of Discrete Area (a) 87,500 ft²

No. of Sample Areas (b) 9 Ratio: (a/2500b) 4.0

Defect Type	Length or Area of Sampled Defects	Total Length or Area of All Defects: (c) x Ratio	Defect Density (per 10 sq. ft.) 10 d/a	Defect Severity Weight	Weighted Defect Density: (e) x (f)
	(c)	(d)	(e)	(f)	(g)
T.C., L.C. or LCJ*					
Reflection Crack					
Faulting					
Patching	NO DEFECTS				
Settlement or Depression					
Pattern Cracking					
Rutting					
Raveling					
Erosion—Jet Blast					
Oil Spillage					
Broken-up Area					
Total					0.00A
<p>Remarks on Pavement Condition</p> <p>Approximately 1/4 of the surface aggregate was stripped of bitumen.</p>					

* Transverse crack, longitudinal crack or longitudinal construction joint crack.

** Letter suffix "A" indicates asphaltic pavement.

ASPHALTIC CONCRETE DISCRETE AREA DEFECT SUMMARY

Airfield USNA LF Monterey Facility South Taxiway

Discrete Area ST-2 Area of Discrete Area (a) 77,500 ft²

No. of Sample Areas (b) 8 Ratio: (a/2500b) 4.0

Defect Type	Length or Area of Sampled Defects	Total Length or Area of All Defects: (c) x Ratio	Defect Density (per 10 sq. ft.) 10 d/a	Defect Severity Weight	Weighted Defect Density: (e) x (f)
	(c)	(d)	(e)	(f)	(g)
T.C., L.C. or LCJ*					
Reflection Crack					
Faulting					
Patching		NO DEFECTS			
Settlement or Depression					
Pattern Cracking					
Rutting					
Raveling					
Erosion—Jet Blast					
Oil Spillage					
Broken-up Area					
Total					0.00A
Remarks on Pavement Condition					

* Transverse crack, longitudinal crack or longitudinal construction joint crack.

** Letter suffix "A" indicates asphaltic pavement.

ASPHALTIC CONCRETE DISCRETE AREA DEFECT SUMMARY

Airfield USNALE Monterey Facility South Taxiway

Discrete Area ST-3 Area of Discrete Area (a) 27,500 ft²

No. of Sample Areas (b) 3 Ratio: (a/2500b) 3.7

Defect Type	Length or Area of Sampled Defects	Total Length or Area of All Defects: (c) x Ratio	Defect Density (per 10 sq. ft.) 10 d/a	Defect Severity Weight	Weighted Defect Density: (e) x (f)
	(c)	(d)	(e)	(f)	(g)
T.C., L.C. or LCJ*	281 ft	1,040 ft	0.378	3.0	1.134
Reflection Crack					
Faulting					
Patching	46 ft ²	170 ft ²	0.062	3.0	0.186
Settlement or Depression					
Pattern Cracking					
Rutting					
Raveling					
Erosion—Jet Blast					
Oil Spillage					
Broken-up Area					
Total					1.32A
Remarks on Pavement Condition					

* Transverse crack, longitudinal crack or longitudinal construction joint crack.

** Letter suffix "A" indicates asphaltic pavement.

ASPHALTIC CONCRETE DISCRETE AREA DEFECT SUMMARY

Airfield USNAF Monterey Facility South Taxiway
 Discrete Area ST-4 Area of Discrete Area (a) 32,500 ft²
 No. of Sample Areas (b) 3 Ratio: (a/2500b) 4.3

Defect Type	Length or Area of Sampled Defects	Total Length or Area of All Defects: (c) x Ratio	Defect Density (per 10 sq. ft.) 10 d/a	Defect Severity Weight	Weighted Defect Density: (e) x (f)
	(c)	(d)	(e)	(f)	(g)
T.C., L.C. or LCJ*	250 ft	1,075 ft	0.331	3.0	0.993
Reflection Crack					
Faulting					
Patching					
Settlement or Depression	50 ft ²	215 ft ²	0.066	9.0	0.594
Pattern Cracking	3,080 ft ²	13,244 ft ²	4.075	3.0	12.225
Rutting					
Revealing	580 ft ²	2,494 ft ²	0.768	7.0	5.376
Erosion—Jet Blast					
Oil Spillage					
Broken-up Area	300 ft ²	1,290 ft ²	0.397	9.0	3.573
Total					22.76A
Remarks on Pavement Condition					
Pattern cracking was of the dendritic type with 4" to 12" legs. Most cracks were 1/8" wide. Cracks were not sealed (see Figure 11).					

* Transverse crack, longitudinal crack or longitudinal construction joint crack.

** Letter suffix "A" indicates asphaltic pavement.

ASPHALTIC CONCRETE DISCRETE AREA DEFECT SUMMARY

Airfield USNALF Monterey Facility South Taxiway

Discrete Area ST-5 Area of Discrete Area (a) 16,000 ft²

No. of Sample Areas (b) 2 Ratio: (a/2500b) 3.2

Defect Type	Length or Area of Sampled Defects	Total Length or Area of All Defects: (c) x Ratio	Defect Density (per 10 sq. ft.) 10 d/a	Defect Severity Weight	Weighted Defect Density: (e) x (f)
	(c)	(d)	(e)	(f)	(g)
T.C., L.C. or LCJ*	275 ft	880 ft	0.550	3.0	1.650
Reflection Crack					
Faulting					
Patching	400 ft ²	1,280 ft ²	0.800	3.0	2.400
Settlement or Depression					
Pattern Cracking					
Rutting					
Reavelling					
Erosion—Jet Blast					
Oil Spillage					
Broken-up Area	300 ft ²	960 ft ²	0.600	9.0	5.400
Total					9.45A
<p>Remarks on Pavement Condition</p> <p>Approximately 90 percent of the surface aggregate was exposed, and the surface was quite rough. See Figure 12 for example of broken up area.</p>					

* Transverse crack, longitudinal crack or longitudinal construction joint crack.

** Letter suffix "A" indicates asphaltic pavement.

ASPHALTIC CONCRETE DISCRETE AREA DEFECT SUMMARY

Airfield USNLF Monterey Facility South Taxiway

Discrete Area ST-6 Area of Discrete Area (a) 33,600 ft²

No. of Sample Areas (b) 4 Ratio: (a/2500b) 3.4

Defect Type	Length or Area of Sampled Defects	Total Length or Area of All Defects: (c) x Ratio	Defect Density (per 10 sq. ft.) 10 d/a	Defect Severity Weight	Weighted Defect Density: (e) x (f)
	(c)	(d)	(e)	(f)	(g)
T.C., L.C. or LCJ*	150 ft	510 ft	0.152	3.0	0.456
Reflection Crack					
Faulting					
Patching					
Settlement or Depression	43 ft ²	146 ft ²	0.043	9.0	0.387
Pattern Cracking	20 ft ²	68 ft ²	0.020	3.0	0.060
Rutting					
Ravelling	20 ft ²	68 ft ²	0.020	7.0	0.140
Erosion-Jet Blast					
Oil Spillage					
Broken-up Area					
Total					1.04A
<p>Remarks on Pavement Condition</p> <p>This area had a rough surfacd with about 75 percent of the surface aggregate exposed. Some vegetation was noted growing through cracks.</p>					

* Transverse crack, longitudinal crack or longitudinal construction joint crack.

** Letter suffix "A" indicates asphaltic pavement.

ASPHALTIC CONCRETE DISCRETE AREA DEFECT SUMMARY

Airfield USNALF Monterey Facility East Taxiway

Discrete Area ET-1 Area of Discrete Area (a) 37,750 ft²

No. of Sample Areas (b) 4 Ratio: (a/2500b) 3.8

Defect Type	Length or Area of Sampled Defects	Total Length or Area of All Defects: (c) x Ratio	Defect Density (per 10 sq. ft.) 10 d/a	Defect Severity Weight	Weighted Defect Density: (e) x (f)
	(c)	(d)	(e)	(f)	(g)
T.C., L.C. or LCJ*	410 ft	1,558 ft	0.413	3.0	1.239
Reflection Crack					
Faulting					
Patching	250 ft	950 ft ²	0.252	3.0	0.756
Settlement or Depression					
Pattern Cracking					
Rutting					
Ravelling	1 ft ²	4 ft ²	0.001	7.0	0.007
Erosion—Jet Blast					
Oil Spillage	3 ft ²	11 ft ²	0.003	1.5	0.005
Broken-up Area					
Total					2.01A
Remarks on Pavement Condition					
Cracks were all in longitudinal construction joints, generally 1/4" wide, and were unsealed. Approximately 1/4 of the surface aggregate was exposed.					

* Transverse crack, longitudinal crack or longitudinal construction joint crack.

** Letter suffix "A" Indicates asphaltic pavement.

ASPHALTIC CONCRETE DISCRETE AREA DEFECT SUMMARY

Airfield USNLF Monterey Facility Cross Taxiway 1

Discrete Area CT1-1 Area of Discrete Area (a) 6,250 ft²

No. of Sample Areas (b) 1 Ratio: (a/2500b) 2.5

Defect Type	Length or Area of Sampled Defects	Total Length or Area of All Defects: (c) x Ratio	Defect Density (per 10 sq. ft.) 10 d/a	Defect Severity Weight	Weighted Defect Density: (e) x (f)
	(c)	(d)	(e)	(f)	(g)
T.C., L.C. or LCJ*					
Reflection Crack					
Faulting					
Patching					
Settlement or Depression		NO DEFECTS			
Pattern Cracking					
Rutting					
Raveling					
Erosion—Jet Blast					
Oil Spillage					
Broken-up Area					
Total					0.00A
Remarks on Pavement Condition					

* Transverse crack, longitudinal crack or longitudinal construction joint crack.

** Letter suffix "A" Indicates asphaltic pavement.

ASPHALTIC CONCRETE DISCRETE AREA DEFECT SUMMARY

Airfield USNALE Monterey Facility Cross Taxiway 1

Discrete Area CT1-2 Area of Discrete Area (a) 6,250 ft²

No. of Sample Areas (b) 1 Ratio: (a/2500b) _____

Defect Type	Length or Area of Sampled Defects	Total Length or Area of All Defects: (c) x Ratio	Defect Density (per 10 sq. ft.) 10 d/a	Defect Severity Weight	Weighted Defect Density: (e) x (f)
	(c)	(d)	(e)	(f)	(g)
T.C., L.C. or LCJ*					
Reflection Crack					
Faulting					
Patching		NO DEFECTS			
Settlement or Depression					
Pattern Cracking					
Rutting					
Ravelling					
Erosion-Jet Blast					
Oil Spillage					
Broken-up Area					
Total					0.00A
Remarks on Pavement Condition					

* Transverse crack, longitudinal crack or longitudinal construction joint crack.

** Letter suffix "A" indicates asphaltic pavement.

ASPHALTIC CONCRETE DISCRETE AREA DEFECT SUMMARY

Airfield USNALF Monterey Facility Cross Taxiway 2

Discrete Area CT2-1 Area of Discrete Area (a) 12,500 ft²

No. of Sample Areas (b) 1 Ratio: (a/2500b) 5.0

Defect Type	Length or Area of Sampled Defects	Total Length or Area of All Defects: (c) x Ratio	Defect Density (per 10 sq. ft.) 10 d/a	Defect Severity Weight	Weighted Defect Density: (e) x (f)
	(c)	(d)	(e)	(f)	(g)
T.C., L.C. or LCJ*					
Reflection Crack					
Faulting					
Patching					
Settlement or Depression					
Pattern Cracking					
Rutting					
Ravelling					
Erosion-Jet Blast					
Oil Spillage	4 ft ²	20 ft ²	0.016	1.5	0.024
Broken-up Area					
Total					0.02A
Remarks on Pavement Condition					

* Transverse crack, longitudinal crack or longitudinal construction joint crack.

** Letter suffix "A" indicates asphaltic pavement.

ASPHALTIC CONCRETE DISCRETE AREA DEFECT SUMMARY

Airfield USNLF Monterey Facility Cross Taxiway 3

Discrete Area CT3-1 Area of Discrete Area (a) 12,500 ft²

No. of Sample Areas (b) 1 Ratio: (a/2500b) 5.0

Defect Type	Length or Area of Sampled Defects	Total Length or Area of All Defects: (c) x Ratio	Defect Density (per 10 sq. ft.) 10 d/a	Defect Severity Weight	Weighted Defect Density: (e) x (f)
	(c)	(d)	(e)	(f)	(g)
T.C., L.C. or LCJ*	50 ft	250 ft	0.200	3.0	0.600
Reflection Crack					
Faulting					
Patching					
Settlement or Depression					
Pattern Cracking	10 ft ²	50 ft ²	0.040	3.0	0.120
Rutting					
Raveling	20 ft ²	100 ft ²	0.080	7.0	0.560
Erosion-Jet Blast					
Oil Spillage					
Broken-up Area					
Total					1.28A
Remarks on Pavement Condition					

* Transverse crack, longitudinal crack or longitudinal construction joint crack.

** Letter suffix "A" indicates asphaltic pavement.

ASPHALTIC CONCRETE DISCRETE AREA DEFECT SUMMARY

Airfield USNLF Monterey Facility Cross Taxiway 4
 Discrete Area CT4-1 Area of Discrete Area (a) 12,500 ft²
 No. of Sample Areas (b) 1 Ratio: (a/2500b) 5.0

Defect Type	Length or Area of Sampled Defects	Total Length or Area of All Defects: (c) x Ratio	Defect Density (per 10 sq. ft.) 10 d/a	Defect Severity Weight	Weighted Defect Density: (e) x (f)
	(c)	(d)	(e)	(f)	(g)
T.C., L.C. or LCJ*	50 ft	250 ft	0.200	3.0	0.600
Reflection Crack					
Faulting					
Patching					
Settlement or Depression	20 ft ²	100 ft ²	0.080	9.0	0.720
Pattern Cracking	350 ft ²	1,750 ft ²	1.400	3.0	4.200
Rutting					
Revealing					
Erosion—Jet Blast					
Oil Spillage					
Broken-up Area					
Total					5.52A
Remarks on Pavement Condition					
<p>A portion of this taxiway was covered with an overlay that had been feathered out from the Runway overlay. This overlaid portion had no defects. On the remainder of the taxiway, approximately 1/4 of the surface aggregate was exposed.</p>					

- * Transverse crack, longitudinal crack or longitudinal construction joint crack.
- ** Letter suffix "A" indicates asphaltic pavement.

ASPHALTIC CONCRETE DISCRETE AREA DEFECT SUMMARY

Airfield USNALF Monterey Facility Cross Taxiway 5

Discrete Area CT5-1 Area of Discrete Area (a) 12,500 ft²

No. of Sample Areas (b) 1 Ratio: (a/2500b) 5.0

Defect Type	Length or Area of Sampled Defects	Total Length or Area of All Defects: (c) x Ratio	Defect Density (per 10 sq. ft.) 10 d/a	Defect Severity Weight	Weighted Defect Density: (e) x (f)
	(c)	(d)	(e)	(f)	(g)
T.C., L.C. or LCJ*	50 ft	250 ft	0.200	3.0	0.600
Reflection Crack					
Faulting					
Patching					
Settlement or Depression					
Pattern Cracking					
Rutting					
Raveling					
Erosion—Jet Blast					
Oil Spillage	10 ft ²	50 ft ²	0.040	1.5	0.060
Broken-up Area					
Total					0.66A
<p>Remarks on Pavement Condition</p> <p>Approximately 50 percent of the surface aggregate was exposed.</p>					

* Transverse crack, longitudinal crack or longitudinal construction joint crack.

** Letter suffix "A" indicates asphaltic pavement.

ASPHALTIC CONCRETE DISCRETE AREA DEFECT SUMMARY

Airfield USNALF Monterey Facility Cross Taxiway 6

Discrete Area CT6-1 Area of Discrete Area (a) 15,000 ft²

No. of Sample Areas (b) 2 Ratio: (a/2500b) 3.0

Defect Type	Length or Area of Sampled Defects	Total Length or Area of All Defects: (c) x Ratio	Defect Density (per 10 sq. ft.) 10 d/a	Defect Severity Weight	Weighted Defect Density: (e) x (f)
	(c)	(d)	(e)	(f)	(g)
T.C., L.C. or LCJ *					
Reflection Crack					
Faulting					
Patching		NO DEFECTS			
Settlement or Depression					
Pattern Cracking					
Rutting					
Raveling					
Erosion—Jet Blast					
Oil Spillage					
Broken-up Area					
Total					0.00A
Remarks on Pavement Condition					
Approximately 75 percent of the surface aggregate was exposed.					

* Transverse crack, longitudinal crack or longitudinal construction joint crack.

** Letter suffix "A" indicates asphaltic pavement.

ASPHALTIC CONCRETE DISCRETE AREA DEFECT SUMMARY

Airfield USNALE Monterey Facility Cross Taxiway 7

Discrete Area CT7-1 Area of Discrete Area (a) 10,000 ft²

No. of Sample Areas (b) 1 Ratio: (a/2500b) 4.0

Defect Type	Length or Area of Sampled Defects	Total Length or Area of All Defects: (c) x Ratio	Defect Density (per 10 sq. ft.) 10 d/a	Defect Severity Weight	Weighted Defect Density: (e) x (f)
	(c)	(d)	(e)	(f)	(g)
T.C., L.C. or LCJ*	100 ft	400 ft	0.400	3.0	1.200
Reflection Crack					
Faulting					
Patching					
Settlement or Depression					
Pattern Cracking	400 ft ²	1,600 ft ²	1.600	3.0	4.800
Rutting					
Raveling					
Erosion—Jet Blast					
Oil Spillage					
Broken-up Area					
Total					6.00A
Remarks on Pavement Condition					
Cracks were generally 1/8" wide, unsealed and had some vegetation growing through them. Pattern cracking was of the dendritic type with 6" to 12" legs (see Figure 13).					

* Transverse crack, longitudinal crack or longitudinal construction joint crack.

** Letter suffix "A" indicates asphaltic pavement.

ASPHALTIC CONCRETE DISCRETE AREA DEFECT SUMMARY

Airfield USNALE Monterey Facility Cross Taxiway 8

Discrete Area CT8-1 Area of Discrete Area (a) 10,000 ft²

No. of Sample Areas (b) 1 Ratio: (a/2500b) 4.0

Defect Type	Length or Area of Sampled Defects	Total Length or Area of All Defects: (c) x Ratio	Defect Density (per 10 sq. ft.) 10 d/a	Defect Severity Weight	Weighted Defect Density: (e) x (f)
	(c)	(d)	(e)	(f)	(g)
T.C., L.C. or LCJ*	50 ft	200 ft	0.200	3.0	0.600
Reflection Crack					
Faulting					
Patching	75 ft ²	300 ft ²	0.300	3.0	0.900
Settlement or Depression					
Pattern Cracking					
Rutting					
Raveling					
Erosion—Jet Blast					
Oil Spillage					
Broken-up Area					
Total					1.50A
Remarks on Pavement Condition					
Approximately 50 percent of the surface aggregate was exposed.					

* Transverse crack, longitudinal crack or longitudinal construction joint crack.

** Letter suffix "A" indicates asphaltic pavement.

ASPHALTIC CONCRETE DISCRETE AREA DEFECT SUMMARY

Airfield USNALF Monterey Facility Cross Taxiway 9

Discrete Area CT9-1 Area of Discrete Area (a) 12,500 ft²

No. of Sample Areas (b) 1 Ratio: (a/2500b) 5.0

Defect Type	Length or Area of Sampled Defects	Total Length or Area of All Defects: (c) x Ratio	Defect Density (per 10 sq. ft.) 10 d/a	Defect Severity Weight	Weighted Defect Density: (e) x (f)
	(c)	(d)	(e)	(f)	(g)
T.C., L.C. or LCJ*	100 ft	500 ft	0.400	3.0	1.200
Reflection Crack					
Faulting					
Patching	50 ft ²	250 ft ²	0.200	3.0	0.600
Settlement or Depression					
Pattern Cracking					
Rutting					
Raveling					
Erosion—Jet Blast					
Oil Spillage	2 ft ²	10 ft ²	0.008	1.5	0.012
Broken-up Area					
Total					1.81A
Remarks on Pavement Condition					
Approximately 50 percent of the surface aggregate was exposed.					

* Transverse crack, longitudinal crack or longitudinal construction joint crack.

** Latter suffix "A" indicates asphaltic pavement.

ASPHALTIC CONCRETE DISCRETE AREA DEFECT SUMMARY

Airfield USNLF Monterey Facility Cross Taxiway 10
 Discrete Area CT10-1 Area of Discrete Area (a) 10,000 ft²
 No. of Sample Areas (b) 1 Ratio: (a/2500b) 4.0

Defect Type	Length or Area of Sampled Defects	Total Length or Area of All Defects: (c) x Ratio	Defect Density (per 10 sq. ft.) 10 d/a	Defect Severity Weight	Weighted Defect Density: (e) x (f)
	(c)	(d)	(a)	(f)	(g)
T.C., L.C. or LCJ*					
Reflection Crack					
Faulting	NO DEFECTS				
Patching					
Settlement or Depression					
Pattern Cracking					
Rutting					
Ravelling					
Erosion—Jet Blast					
Oil Spillage					
Broken-up Area					
Total					0.00A
Remarks on Pavement Condition					
Approximately 25 percent of the surface aggregate was exposed.					

- * Transverse crack, longitudinal crack or longitudinal construction joint crack.
 ** Letter suffix "A" indicates asphaltic pavement.

ASPHALTIC CONCRETE DISCRETE AREA DEFECT SUMMARY

Airfield USNALF Monterey Facility Cross Taxiway 11

Discrete Area CT11-1 Area of Discrete Area (a) 8,750 ft²

No. of Sample Areas (b) 1 Ratio: (a/2500b) 3.5

Defect Type	Length or Area of Sampled Defects	Total Length or Area of All Defects: (c) x Ratio	Defect Density (per 10 sq. ft.) 10 d/a	Defect Severity Weight	Weighted Defect Density: (e) x (f)
	(c)	(d)	(e)	(f)	(g)
T.C., L.C. or LCJ*	50 ft	175 ft	0.200	3.0	0.600
Reflection Crack					
Faulting					
Patching					
Settlement or Depression					
Pattern Cracking	40 ft ²	140 ft ²	0.160	3.0	0.480
Rutting					
Raveling					
Erosion-Jet Blast					
Oil Spillage					
Broken-up Area					
Total					1.08A
<p>Remarks on Pavement Condition</p> <p>Pattern cracking was of the dendritic type with 3" to 12" legs. Approximately 50 percent of the surface aggregate was exposed.</p>					

* Transverse crack, longitudinal crack or longitudinal construction joint crack.

** Letter suffix "A" indicates asphaltic pavement.

ASPHALTIC CONCRETE DISCRETE AREA DEFECT SUMMARY

Airfield USNLF Monterey Facility Parking Apron 1
 Discrete Area PA1-2 Area of Discrete Area (a) 27,440 ft²
 No. of Sample Areas (b) 3 Ratio: (a/2500b) 3.7

Defect Type	Length or Area of Sampled Defects	Total Length or Area of All Defects: (c) x Ratio	Defect Density (per 10 sq. ft.) 10 d/a	Defect Severity Weight	Weighted Defect Density: (e) x (f)
	(c)	(d)	(e)	(f)	(g)
T.C., L.C. or LCJ*					
Reflection Crack					
Faulting					
Patching					
Settlement or Depression					
Pattern Cracking					
Rutting					
Raveling					
Erosion—Jet Blast	500 ft ²	1,850 ft ²	0.674	7.5	5.055
Oil Spillage	3,800 ft ²	14,060 ft ²	5.124	1.5	7.686
Broken-up Area					
Total					12.74A
Remarks on Pavement Condition					
Erosion of oil spilled areas was as much as 2" deep. Surface in other areas was softened by the oil spillage (see Figure 14).					

* Transverse crack, longitudinal crack or longitudinal construction joint crack.

** Letter suffix "A" indicates asphaltic pavement.

ASPHALTIC CONCRETE DISCRETE AREA DEFECT SUMMARY

Airfield USNALF Monterey Facility Parking Apron 1
 Discrete Area PA1-3 Area of Discrete Area (a) 40,800 ft²
 No. of Sample Areas (b) 4 Ratio: (a/2500b) 4.1

Defect Type	Length or Area of Sampled Defects	Total Length or Area of All Defects: (c) x Ratio	Defect Density (per 10 sq. ft.) 10 d/a	Defect Severity Weight	Weighted Defect Density: (e) x (f)
	(c)	(d)	(e)	(f)	(g)
T.C., L.C. or LCJ *	95 ft	390 ft	0.096	3.0	0.288
Reflection Crack					
Faulting					
Patching	4 ft ²	16 ft ²	0.004	3.0	0.012
Settlement or Depression					
Pattern Cracking					
Rutting					
Raveling	70 ft ²	287 ft ²	0.070	7.0	0.490
Erosion—Jet Blast					
Oil Spillage	4,000 ft ²	16,400 ft ²	4.020	1.5	6.030
Broken-up Area					
Total					6.82A
Remarks on Pavement Condition Raveling was up to 1" in depth. Surface appeared oxidized where it was not covered with oil spillage (see Figure 15).					

- * Transverse crack, longitudinal crack or longitudinal construction joint crack.
- ** Letter suffix "A" indicates asphaltic pavement.

ASPHALTIC CONCRETE DISCRETE AREA DEFECT SUMMARY

Airfield USNAIF Monterey Facility Parking Apron 3
 Discrete Area PA3-3 Area of Discrete Area (a) 16,875 ft²
 No. of Sample Areas (b) 2 Ratio: (a/2500b) 3.4

Defect Type	Length or Area of Sampled Defects	Total Length or Area of All Defects: (c) x Ratio	Defect Density (per 10 sq. ft.) 10 d/a	Defect Severity Weight	Weighted Defect Density: (e) x (f)
	(c)	(d)	(e)	(f)	(g)
T.C., L.C. or LCJ *					
Reflection Crack					
Faulting					
Petching					
Settlement or Depression					
Pattern Cracking					
Rutting					
Raveling	2 ft ²	7 ft ²	0.004	7.0	0.028
Erosion—Jet Blast					
Oil Spillage	1,600 ft ²	5,440 ft ²	3.224	1.5	4.836
Broken-up Area					
Total)					4.86A
Remarks on Pavement Condition					

- * Transverse crack, longitudinal crack or longitudinal construction joint crack.
 ** Letter suffix "A" indicates asphaltic pavement.

ASPHALTIC CONCRETE DISCRETE AREA DEFECT SUMMARY

Airfield USNLF Monterey Facility Parking Apron 3

Discrete Area PA3-4 Area of Discrete Area (a) 130,000 ft²

No. of Sample Areas (b) 12 Ratio: (a/2500b) 4.3

Defect Type	Length or Area of Sampled Defects	Total Length or Area of All Defects: (c) x Ratio	Defect Density (per 10 sq. ft.) 10 d/a	Defect Severity Weight	Weighted Defect Density: (e) x (f)
	(c)	(d)	(e)	(f)	(g)
T.C., L.C. or LCJ*					
Reflection Crack					
Faulting					
Patching					
Settlement or Depression					
Pattern Cracking					
Rutting					
Raveling					
Erosion—Jet Blast					
Oil Spillage	1,530 ft ²	6,579 ft ²	0.506	1.5	0.759
Broken-up Area					
Total					0.76A
<p>Remarks on Pavement Condition</p> <p>Surface appearance was good. About 1/4 of the surface aggregate was exposed. Some vegetation was observed growing between tiedowns and asphaltic concrete pavement.</p>					

* Transverse crack, longitudinal crack or longitudinal construction joint crack.

** Letter suffix "A" indicates asphaltic pavement.

ASPHALTIC CONCRETE DISCRETE AREA DEFECT SUMMARY

Airfield USNALF Monterey Facility Parking Apron 4
 Discrete Area PA4-1 Area of Discrete Area (a) 225,000 ft²
 No. of Sample Areas (b) 6 Ratio: (a/2500b) 15.0

Defect Type	Length or Area of Sampled Defects	Total Length or Area of All Defects: (c) x Ratio	Defect Density (per 10 sq. ft.) 10 d/a	Defect Severity Weight	Weighted Defect Density: (e) x (f)
	(c)	(d)	(e)	(f)	(g)
T.C., L.C. or LCJ*					
Reflection Crack					
Faulting					
Patching					
Settlement or Depression					
Pattern Cracking					
Rutting					
Ravelling					
Erosion—Jet Blast					
Oil Spillage	1,550 ft ²	23,250	1.033	1.5	1.550
Broken-up Area					
Total					1.55A
Remarks on Pavement Condition					

* Transverse crack, longitudinal crack or longitudinal construction joint crack.

** Letter suffix "A" indicates asphaltic pavement.

ASPHALTIC CONCRETE DISCRETE AREA DEFECT SUMMARY

Airfield USNALF Monterey Facility Parking Apron 4
 Discrete Area PA4-2 Area of Discrete Area (a) 18,500 ft²
 No. of Sample Areas (b) 5 Ratio: (a/2500b) 1.5

Defect Type	Length or Area of Sampled Defects	Total Length or Area of All Defects: (c) x Ratio	Defect Density (per 10 sq. ft.) 10 d/a	Defect Severity Weight	Weighted Defect Density: (e) x (f)
	(c)	(d)	(e)	(f)	(g)
T.C., L.C. or LCJ*					
Reflection Crack					
Faulting					
Patching					
Settlement or Depression					
Pattern Cracking					
Rutting					
Raveling					
Erosion—Jet Blast					
Oil Spillage	350 ft ²	525 ft ²	0.284	1.5	0.426
Broken-up Area					
Total					0.43A
Remarks on Pavement Condition					

- * Transverse crack, longitudinal crack or longitudinal construction joint crack.
 ** Letter suffix "A" indicates asphaltic pavement.

ASPHALTIC CONCRETE DISCRETE AREA DEFECT SUMMARY

Airfield USNALF Monterey Facility Holding Apron 1

Discrete Area HAL-1 Area of Discrete Area (a) 52,500 ft²

No. of Sample Areas (b) 5 Ratio: (a/2500b) 4.2

Defect Type	Length or Area of Sampled Defects	Total Length or Area of All Defects: (c) x Ratio	Defect Density (per 10 sq. ft.) 10 d/a	Defect Severity Weight	Weighted Defect Density: (e) x (f)
	(c)	(d)	(e)	(f)	(g)
T.C., L.C. or LCJ*					
Reflection Crack					
Faulting					
Patching					
Settlement or Depression					
Pattern Cracking					
Rutting					
Raveling					
Erosion-Jet Blast					
Oil Spillage	1 ft ²	4.2 ft ²	0.0008	1.5	0.001
Broken-up Area					
Total					0.00A
Remarks on Pavement Condition					
Excellent smooth surface, with less than 25 percent of the surface aggregate exposed.					

* Transverse crack, longitudinal crack or longitudinal construction joint crack.

** Latter suffix "A" indicates asphaltic pavement.

ASPHALTIC CONCRETE DISCRETE AREA DEFECT SUMMARY

Airfield USNLF Monterey Facility Holding Apron 2

Discrete Area HA2-1 Area of Discrete Area (a) 22,500 ft²

No. of Sample Areas (b) 2 Ratio: (a/2500b) 4.5

Defect Type	Length or Area of Sampled Defects	Total Length or Area of All Defects: (c) x Ratio	Defect Density (per 10 sq. ft.) 10 d/a	Defect Severity Weight	Weighted Defect Density: (e) x (f)
	(c)	(d)	(e)	(f)	(g)
T.C., L.C. or LCJ*					
Reflection Crack					
Faulting					
Patching					
Settlement or Depression		NO DEFECTS			
Pattern Cracking					
Rutting					
Raveling					
Erosion-Jet Blast					
Oil Spillage					
Broken-up Area					
Total					0.00A
Remarks on Pavement Condition					

* Transverse crack, longitudinal crack or longitudinal construction joint crack.

** Letter suffix "A" indicates asphaltic pavement.

PORTLAND CEMENT CONCRETE DISCRETE AREA DEFECT SUMMARY

Airfield USNLF Monterey Facility Parking Apron 1

Discrete Area PA1-1 Total Slabs in Discrete Area (a) 784

No. of Slabs Sampled (b) 196 Ratio a/b = 4.0

Defect Type	No. of Sample Slabs w/Defect	Total Slabs w/Defect: c x a/b	Defect Density (per slab) d/a	Defect Severity Weight	Weighted Defect Density e x f
	(c)	(d)	(e)	(f)	(g)
Faulting					
Corner Break					
L.C. or T.C.*	75	300	0.383	1.5	0.574
I.C.**	1	4	0.005	3.0	0.015
Depression					
Spalling	43	172	0.219	7.5	1.642
Scaling					
Shattered Slab					
Joint Seal	24	96	0.122	3.0	0.366
Pumping					
"D-line" cracking					
Remarks on Pavement Condition				Total	2.60 C
<p>Most cracks were transverse, 1/8" wide and unsealed. Most spalls occurred on the transverse cracks. Joint seal defects consisted of vegetation growing through joints and embedded gravel (see Figures 16 and 17).</p>					

* Longitudinal crack or Transverse crack

** Intersecting crack

*** Letter suffix "C" represents PCC pavement

PORTLAND CEMENT CONCRETE DISCRETE AREA DEFECT SUMMARY

Airfield USNALT Monterey Facility Parking Apron 2

Discrete Area PA2-1 Total Slabs in Discrete Area (a) 1,168

No. of Slabs Sampled (b) 195 Ratio a/b = 6.0

Defact Type	No. of Sample Slabs w/Defect	Total Slabs w/Defect: c x a/b	Defect Density (per slab) d/a	Defect Severity Weight	Weighted Defect Density e x f
	(c)	(d)	(e)	(f)	(g)
Faulting					
Corner Break					
L.C. or T.C.*					
I.C.**					
Depression					
Spalling	6	36	0.031	7.5	0.232
Scaling					
Shattered Slab					
Joint Seal	36	216	0.185	3.0	0.555
Pumping					
"D-line" cracking					
Remarks on Pavement Condition					Total
					0.79 C

- * Longitudinal crack or Transverse crack
- ** Intersecting crack
- *** Latter suffix "C" represents PCC pavement

PORTLAND CEMENT CONCRETE DISCRETE AREA DEFECT SUMMARY

Airfield USNAF Monterey Facility Parking Apron 3

Discrete Area PA3-1 Total Slabs in Discrete Area (a) 480

No. of Slabs Sampled (b) 120 Ratio a/b = 4.0

Defect Type	No. of Sample Slabs w/Defect	Total Slabs w/Defect: c x a/b	Defect Density (per slab) d/a	Defect Severity Weight	Weighted Defect Density e x f
	(c)	(d)	(e)	(f)	(g)
Feuiting					
Corner Breck					
L.C. or T.C.*					
I.C.**					
Depression					
Spelling	10	40	0.083	7.5	0.622
Scaling					
Shattered Slab					
Joint Seal	15	60	0.125	3.0	0.375
Pumping	2	8	0.017	4.0	0.068
"D-line" cracking					
Remarks on Pavement Condition				Total	1.07 C

Most spalls ranged from 1" by 2" to 1" by 4". Joint seal defects consisted mainly of vegetation growing through joints (see Figures 18 and 19). Pumping slabs were based on stains observed on the surface adjacent to the joints.

- * Longitudinal crack or Transverse crack
- ** Intersecting crack
- *** Letter suffix "C" represents PCC pavement

PORTLAND CEMENT CONCRETE DISCRETE AREA DEFECT SUMMARY

Airfield USNAF Monterey Facility Parking Apron 3

Discrete Area PA3-2 Total Slabs in Discrete Area (a) 156

No. of Slabs Sampled (b) 39 Ratio a/b = 4.0

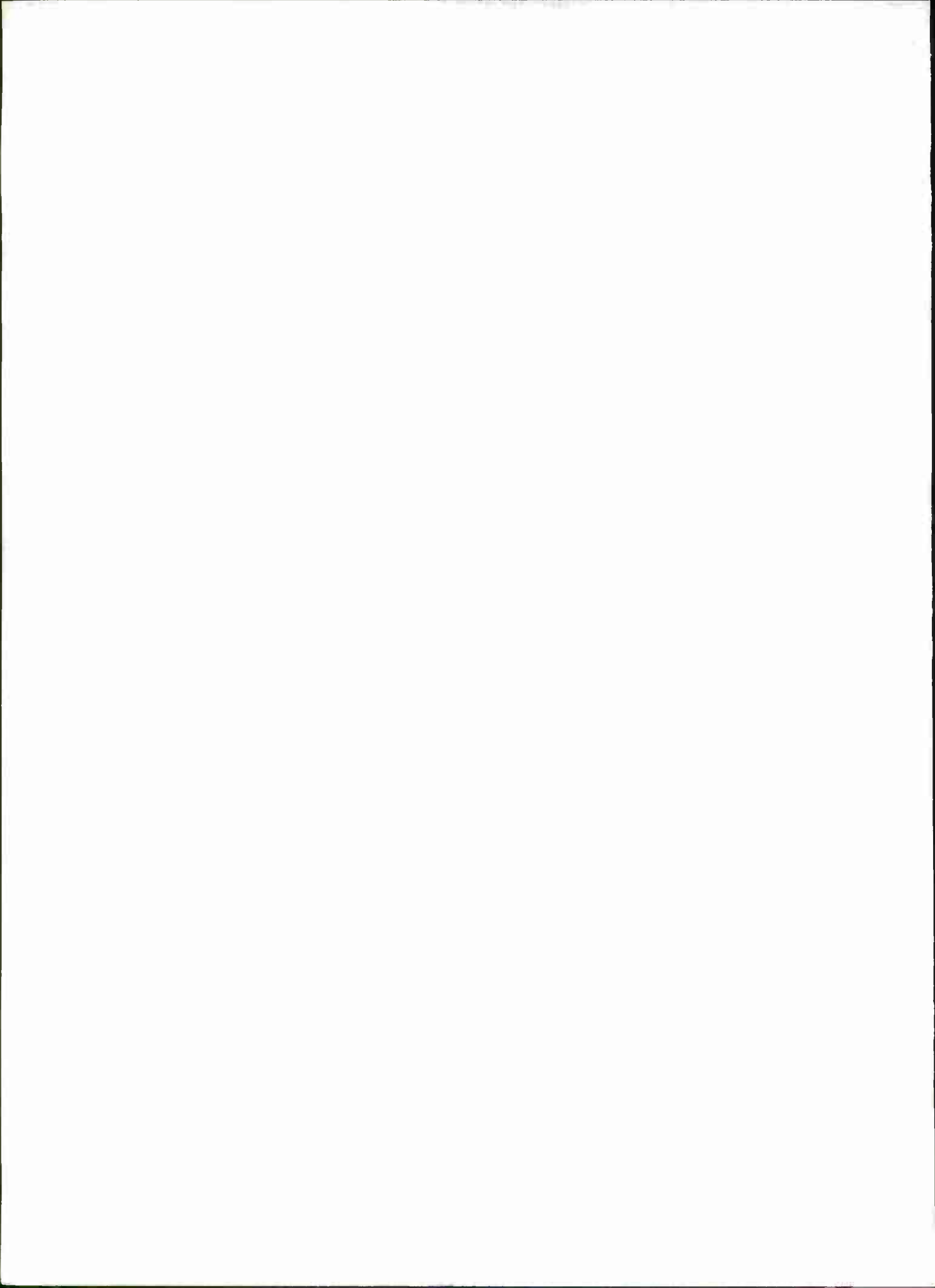
Defect Type	No. of Sample Slabs w/Defect	Total Slabs w/Defect: c x a/b	Defect Density (per slab) d/a	Defect Severity Weight	Weighted Defect Density e x f
	(c)	(d)	(e)	(f)	(g)
Faulting					
Corner Break	4	16	0.102	3.0	0.306
L.C. or T.C. *	9	36	0.231	1.5	0.347
I.C. **	4	16	0.102	3.0	0.306
Depression					
Spalling	28	112	0.718	7.5	5.385
Scaling	1	4	0.026	7.0	0.182
Shattered Slab	8	32	0.205	9.0	1.845
Joint Seal	39	156	1.000	3.0	3.000
Pumping					
"D-line" cracking					
Remarks on Pavement Condition_____					Total
					11.37 C

Spalls varied in size from 1" by 1" to 3" by 18". Many spalls occurred on transverse cracks. Joint seal was missing in most joints, many joints had vegetation growing through them, and some joint seal contained small embedded gravel particles (see Figures 20 and 21).

- * Longitudinal crack or Transverse crack
- ** Intersecting crack
- *** Letter suffix "C" represents PCC pavement

ASPHALTIC AND PORTLAND CEMENT CONCRETE

FACILITY DEFECT SUMMARY SHEETS



ASPHALTIC CONCRETE FACILITY DEFECT SUMMARY

Airfield USNAIF Monterey, California

Date Surveyed September 1971

Facility (or portion)	Weighted Defect Density Total	Ratio: <u>Discrete Area</u> Total Facility Area*	Average Weighted Defect Density (a) x (b)
	(a)**	(b)	(c)**
Runway 6-24			
R6-1	2.10A	1.00	2.10A
Runway 10-28			
R10-1	2.08A	0.76	1.58
R10-2	0.45A	0.24	0.11
			<u>1.69A (Total)</u>
Taxiway 6-24			
T6-1	2.90A	1.00	2.90A
Taxiway 10-28			
T10-1	10.19A	1.00	10.19A
South Taxiway			
ST-1	0.00A	0.32	0.00
ST-2	0.00A	0.28	0.00
ST-3	1.32A	0.10	0.13
ST-4	22.76A	0.12	2.73
ST-5	9.45A	0.06	0.57
ST-6	1.04A	0.12	0.12
			<u>3.55A (Total)</u>
East Taxiway			
ET-1	2.01A	1.00	2.01A
Cross Taxiway 1			
CT1-1	0.00A	0.50	0.00
CT1-2	0.00A	0.50	0.00
			<u>0.00A (Total)</u>

* If facility entirely constructed of AC, indicates total facility area. If facility only partly constructed of AC, indicates total area of AC portion of facility.

** Letter suffix "A" on weighted defect densities indicates asphaltic concrete pavements.

ASPHALTIC CONCRETE FACILITY DEFECT SUMMARY Airfield <u>USNAIF Monterey, California</u> Date Surveyed <u>September 1971</u>			
Facility (or portion)	Weighted Defect Density Total	Ratio: <u>Discrete Area</u> Total Facility Area*	Average Weighted Defect Density (a) x (b)
	(a)**	(b)	(c)**
Cross Taxiway 2 CT2-1	0.02A	1.00	0.02A
Cross Taxiway 3 CT3-1	1.28A	1.00	1.28A
Cross Taxiway 4 CT4-1	5.52A	1.00	5.52A
Cross Taxiway 5 CT5-1	0.66A	1.00	0.66A
Cross Taxiway 6 CT6-1	0.00A	1.00	0.00A
Cross Taxiway 7 CT7-1	6.00A	1.00	6.00A
Cross Taxiway 8 CT8-1	1.50A	1.00	1.50A
Cross Taxiway 9 CT9-1	1.81A	1.00	1.81A
Cross Taxiway 10 CT10-1	0.00A	1.00	0.00A
Cross Taxiway 11 CT11-1	1.08A	1.00	1.08A

* If facility entirely constructed of AC, indicates total facility area. If facility only partly constructed of AC, indicates total area of AC portion of facility.

** Letter suffix "A" on weighted defect densities indicates asphaltic concrete pavements.

ASPHALTIC CONCRETE FACILITY DEFECT SUMMARY

Airfield USNAIF Monterey, California

Date Surveyed September 1971

Facility (or portion)	Weighted Defect Density Total	Ratio: <u>Discrete Area</u> Total Facility Area*	Average Weighted Defect Density (a) x (b)
	(a)**	(b)	(c)**
Parking Apron 1			
PA1-2	12.74A	0.40	5.10
PA1-3	6.82A	0.60	4.09
			<u>9.19A</u> (Total)
Parking Apron 3			
PA3-3	4.86A	0.11	0.53
PA3-4	0.76A	0.89	0.68
			<u>1.21A</u> (Total)
Parking Apron 4			
PA4-1	1.55A	0.92	1.43
PA4-2	0.43A	0.08	0.03
			<u>1.46A</u> (Total)
Holding Apron 1			
HA1-1	0.00A	1.00	0.00A
Holding Apron 2			
HA2-1	0.00A	1.00	0.00A

* If facility entirely constructed of AC, indicates total facility area. If facility only partly constructed of AC, indicates total area of AC portion of facility.

** Letter suffix "A" on weighted defect densities indicates asphaltic concrete pavements.

PORTLAND CEMENT CONCRETE FACILITY DEFECT SUMMARY

Airfield USNALF Monterey, California

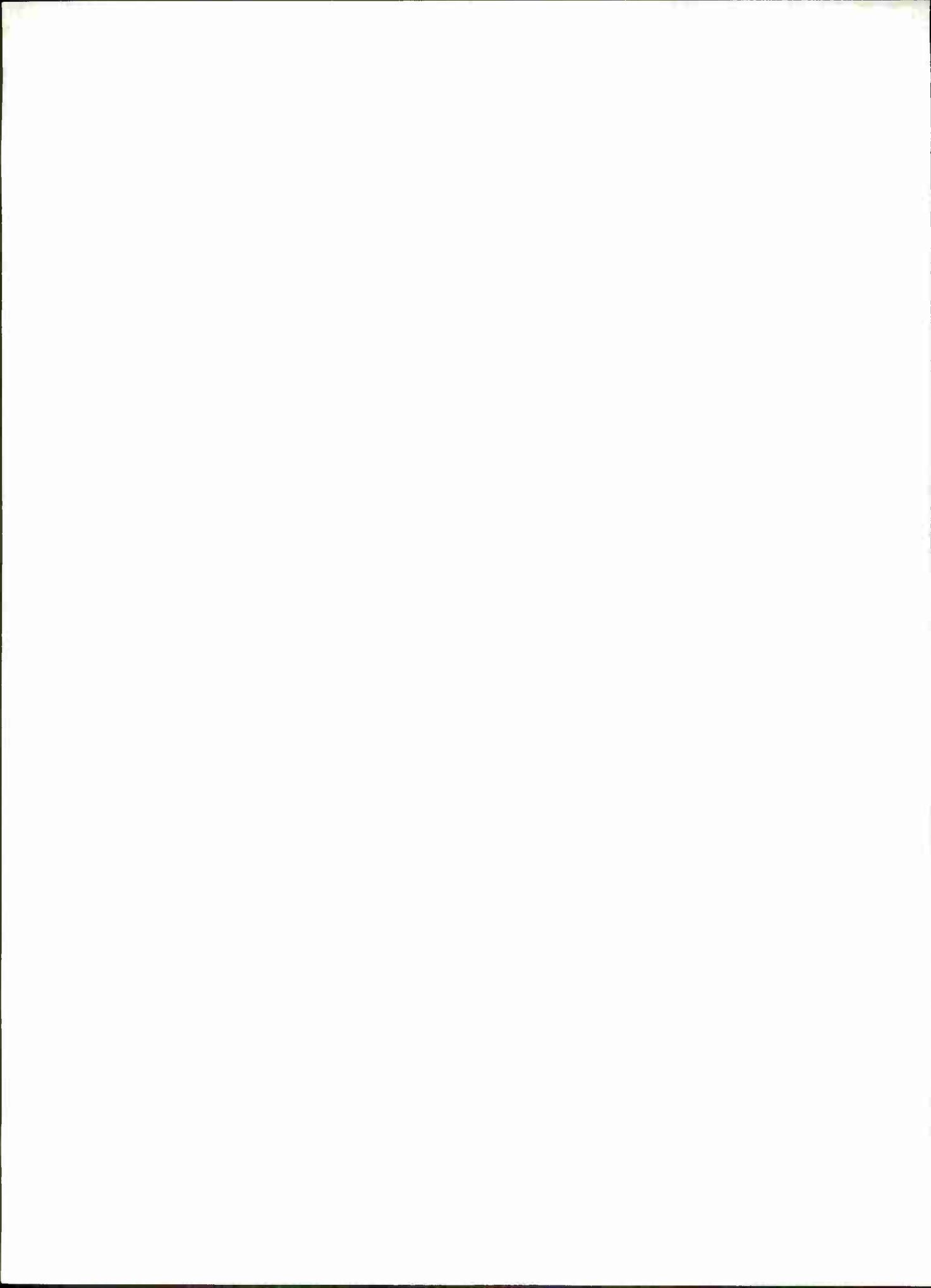
Date Surveyed September 1971

Facility (or portion)	Weighted Defect Density Total	Ratio: <u>Discrete Area</u> Total Facility Area*	Average Weighted Defect Density (a) x (b)
	(a)**	(b)	(c)**
Parking Apron 1 PA1-1	2.60C	1.00	2.60C
Parking Apron 2 PA2-1	0.79C	1.00	0.79C
Parking Apron 3 PA3-1	1.07C	0.25	0.27
PA3-2	11.37C	0.75	<u>8.53</u>
			8.80C (Total)

* If facility entirely constructed of PCC, indicates total facility area. If facility only partly constructed of PCC, indicates total area of PCC portion of facility.

** Letter suffix "C" on weighted defect densities indicates Portland cement concrete pavements.

APPENDIX A
CONSTRUCTION HISTORY



Appendix A

CONSTRUCTION HISTORY FOR USNALE Monterey, California

Item No.	Section From Surface to Subgrade	Date Constructed	Date Strengthened or Sealed
1	Portion of Runway 10-28		
	(overlay feathers out to cross runway		
	and taxiways)		
	3" - 4" Asphaltic concrete overlay		1967
	75' center - Heater remix		1967
	Seal coat (Gilsonite)		1965
	2" Asphaltic concrete	1942	
	8" Crushed base course	1942	
1A	Portion of Runway 10-28, Portion of		
	South Taxiway, Holding Apron		
	4" Bituminous surface course	1967	
	10" Crushed aggregate base	1967	
1B	Portion of Runway 10-28		
	3" Bituminous surface course	1967	
	8" Crushed aggregate base	1967	
1C	Portion of Runway 10-28 and CT-1		
	3" - 4" Asphaltic concrete overlay	1967	
	2" - 3" Plant mix surface		
	(reconstruction)	1967	

Appendix A

CONSTRUCTION HISTORY FOR USNALE Monterey, California

Item No.	Section From Surface to Subgrade	Date Constructed	Date Strengthened or Sealed
1C	(Cont'd)		
	7" - 8" Base (reconstruction)	1967	
1D	Taxiway 10-28 Widening		
	Seal coat (Gilsonite)		1965
	2" Asphaltic concrete	1949	
	12" Crushed rock base	1949	
1E	Portion of Taxiway 10-28		
	Runway 6-24, Taxiway 6-24		
	Seal coat (Gilsonite)		1965
	2" Asphaltic concrete	1942	
	8" Crushed base course	1942	
2	Connecting Taxiways 5, 6, and 9		
	Seal coat		1965
	2" Asphaltic concrete	1943	
	8" Crushed base	1943	
3	East Taxiway		
	2" Asphaltic concrete	1949	
	8" Base course	1949	

Appendix A

CONSTRUCTION HISTORY FOR USNALE Monterey, California

Item No.	Section From Surface to Subgrade	Date Constructed	Date Strengthened or Sealed
3	(Cont'd)		
	Compacted subgrade	1949	
4	Portion of Parking Apron 1		
	8" Portland cement concrete	1942	
	Compacted subgrade	1942	
4A	Portion of Parking Apron 1		
	8" Portland cement concrete	1943	
	Compacted subgrade	1943	
5	Portion of Parking Apron 3		
	8" Portland cement concrete	1943	
	Compacted subgrade	1943	
6	Parking Apron 2		
	8" Portland cement concrete	1954	
	Compacted subgrade	1954	
7	Portion of Parking Apron 3		
	8" Portland cement concrete	1950	
	Compacted subgrade	1950	

Appendix A

CONSTRUCTION HISTORY FOR USNALE Monterey, California

Item No.	Section From Surface to Subgrade	Date Constructed	Date Strengthened or Sealed
8	Connecting Taxiway 4		
	Seal coat (Gilsonite)		1965
	2" Asphaltic concrete	1950	
	7" Crushed rock base	1950	
9	Portion of Parking Apron 3		
	2" Asphaltic concrete	1954	
	7" Crushed base course	1954	
10	Cross Taxiway 10, portion of South Taxiway and Parking Apron 3		
	Seal coat (Gilsonite)		1965
	2" Asphaltic concrete	1959	
	9" Crushed base course	1959	
11	Portion of South Taxiway		
	Seal coat (Gilsonite)		1965
	3" Asphaltic concrete	1964	
	7" Crushed base course	1964	
12	Portion of South Taxiway		
	Seal coat (Gilsonite)		1965

Appendix A

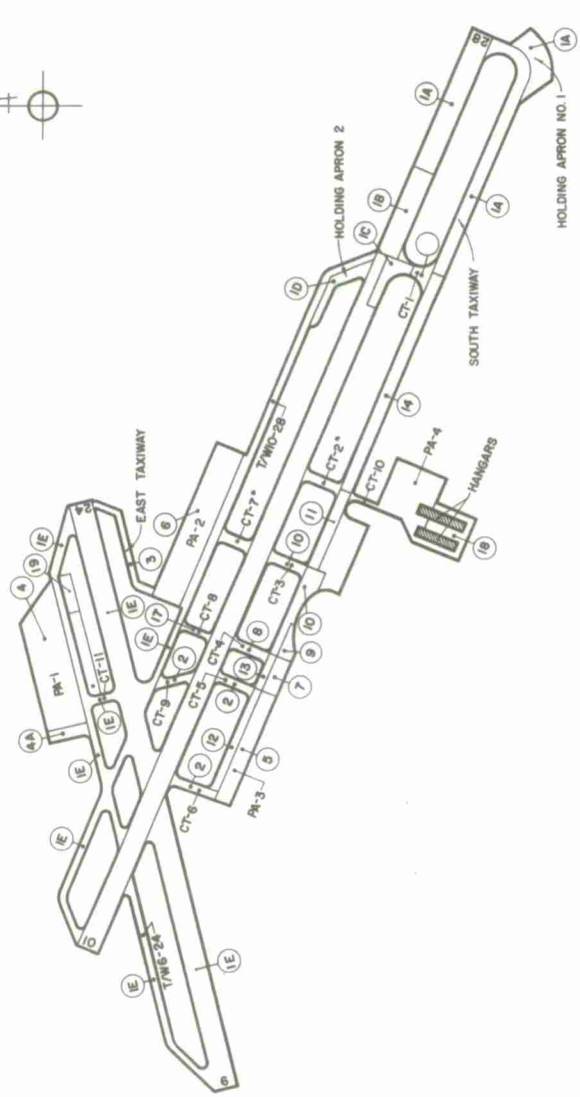
CONSTRUCTION HISTORY FOR USNALE Monterey, California

Item No.	Section From Surface to Subgrade	Date Constructed	Date Strengthened or Sealed
12	(Cont'd)		
	2" Asphaltic concrete	1954	
	7" Crushed aggregate base course	1954	
	Compacted subgrade	1954	
13	Portion of South Taxiway		
	Seal coat (Gilsonite)		1965
	2" Asphaltic concrete	1958	
	7" Crushed aggregate base course	1958	
14	Portion of South Taxiway		
	3" Asphaltic concrete	1965	
	7" Crushed base course	1965	
15	Parking Apron 4 and Connecting Taxiway 10		
	2" Asphaltic concrete	1964	
	6" Crushed base course	1964	
16	Portion of Parking Apron 3		
	3" Asphaltic concrete	1966	
	7" Crushed base course	1966	

Appendix A

CONSTRUCTION HISTORY FOR USNLF Monterey, California

Item No.	Section From Surface to Subgrade	Date Constructed	Date Strengthened or Sealed
17	Connecting Taxiway 8		
	2" Asphaltic concrete	1950	
	7" Base	1950	
18	Portion of Parking Apron 4		
	4" Asphaltic concrete	1968	
	10" Base	1968	
19	Portion of Parking Apron 1		
	2" Asphaltic concrete surface	1970	
	6" Scarified and recompactd		
	existing pavement	1970	



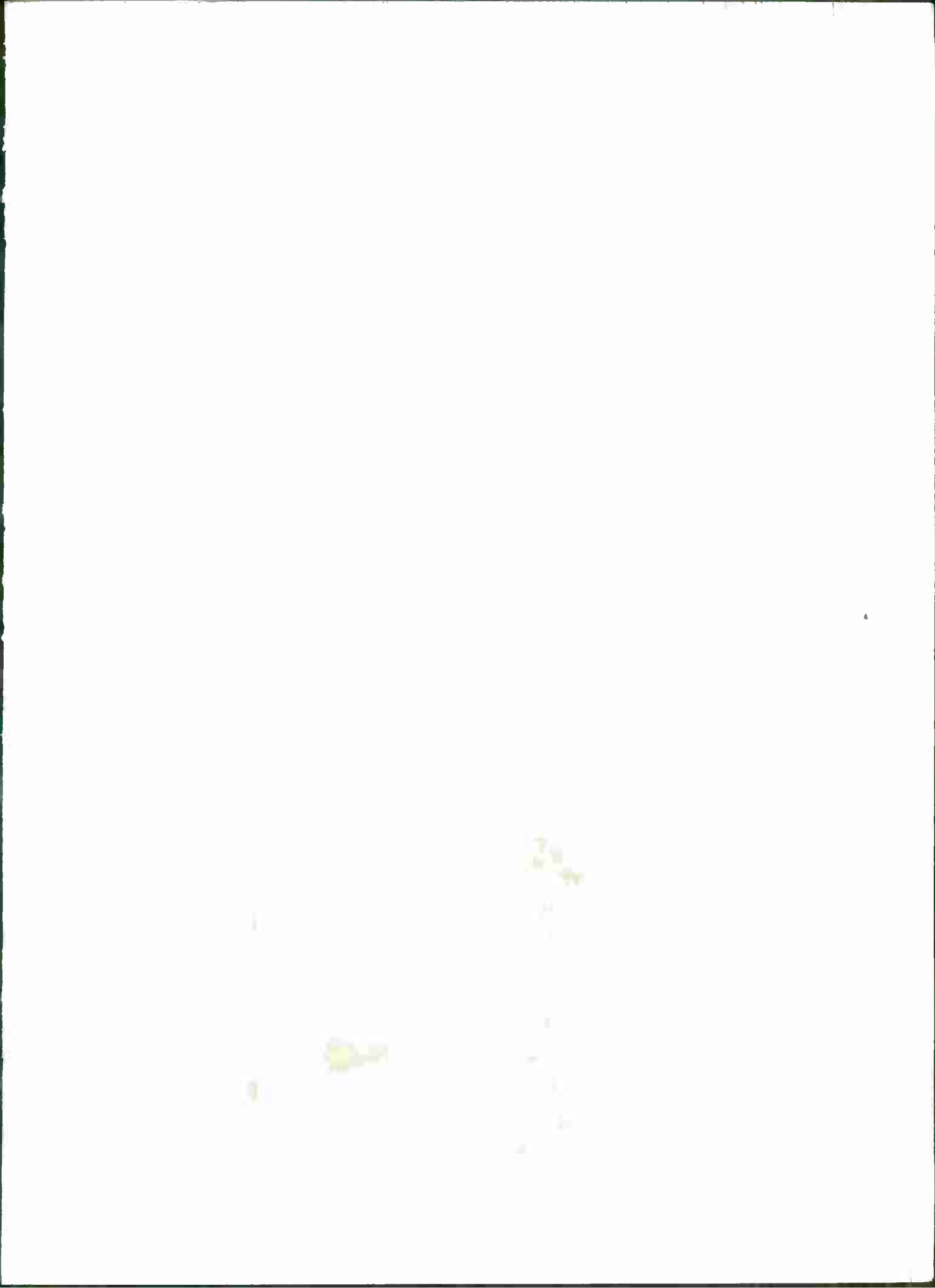
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PROJECT NO.	71-31-2F	REPORT NO.	71-31-2F
DATE	10/1/68	BY	U.S. AIR FORCE
USNAF MONTEREY, CALIFORNIA PAVEMENT CONDITION SURVEY CONSTRUCTION HISTORY			
71-31-2F			

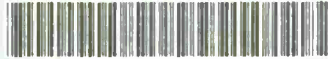
APPENDIX A, FIGURE A 1

REFERENCE

1. Naval Civil Engineering Laboratory. Technical Note N-940: Air-field pavement evaluation, USNLF Monterey, California, by D. J. Lambiotte, Port Hueneme, California, December 1967.



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